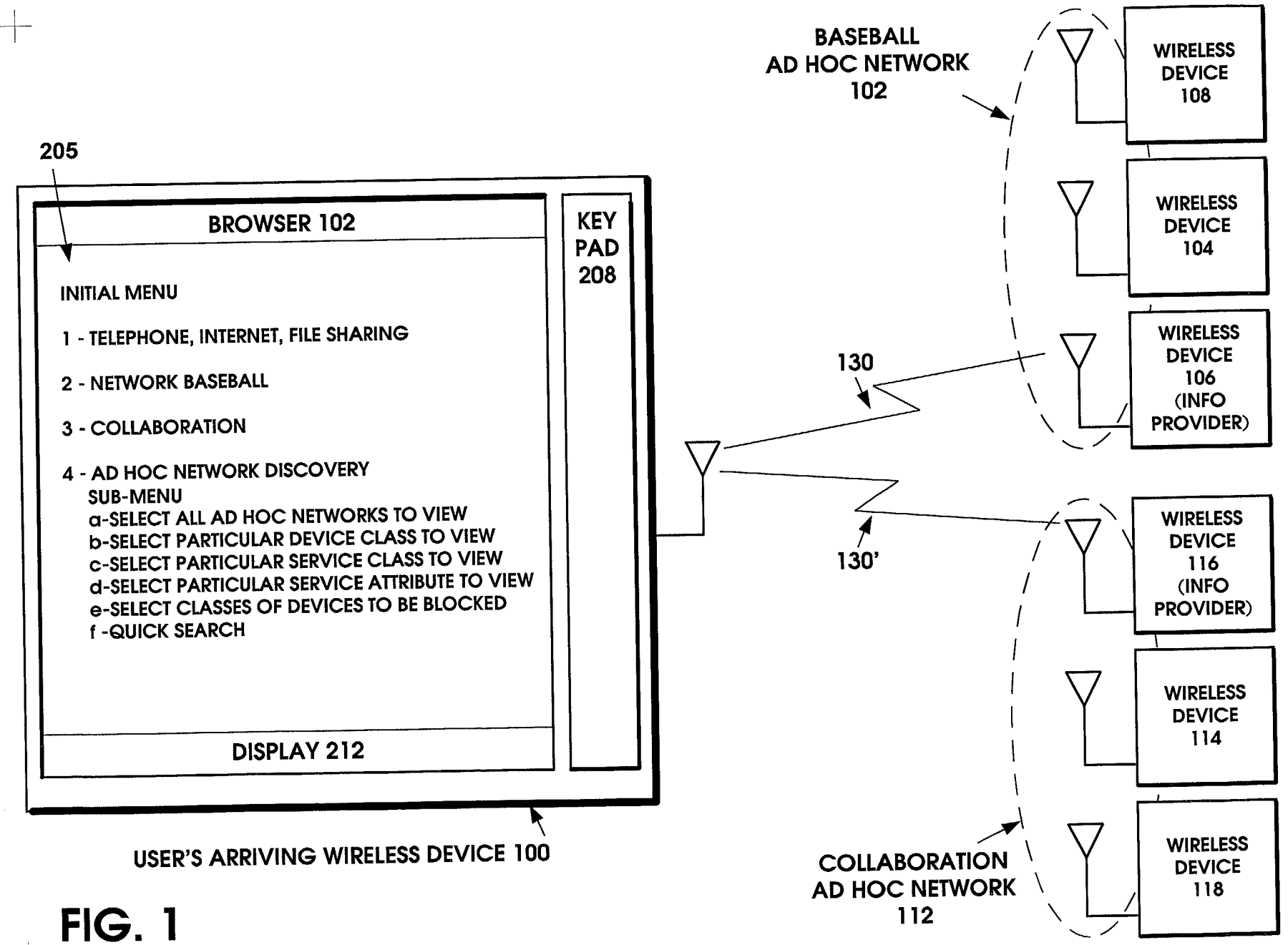


FIG. 1

Mikko Oikkonen, Kai Nyman, Stephane Bouet
AD HOC NETWORKING DISCOVERY MENU
28377 (4208-4003)

FIG. 1A

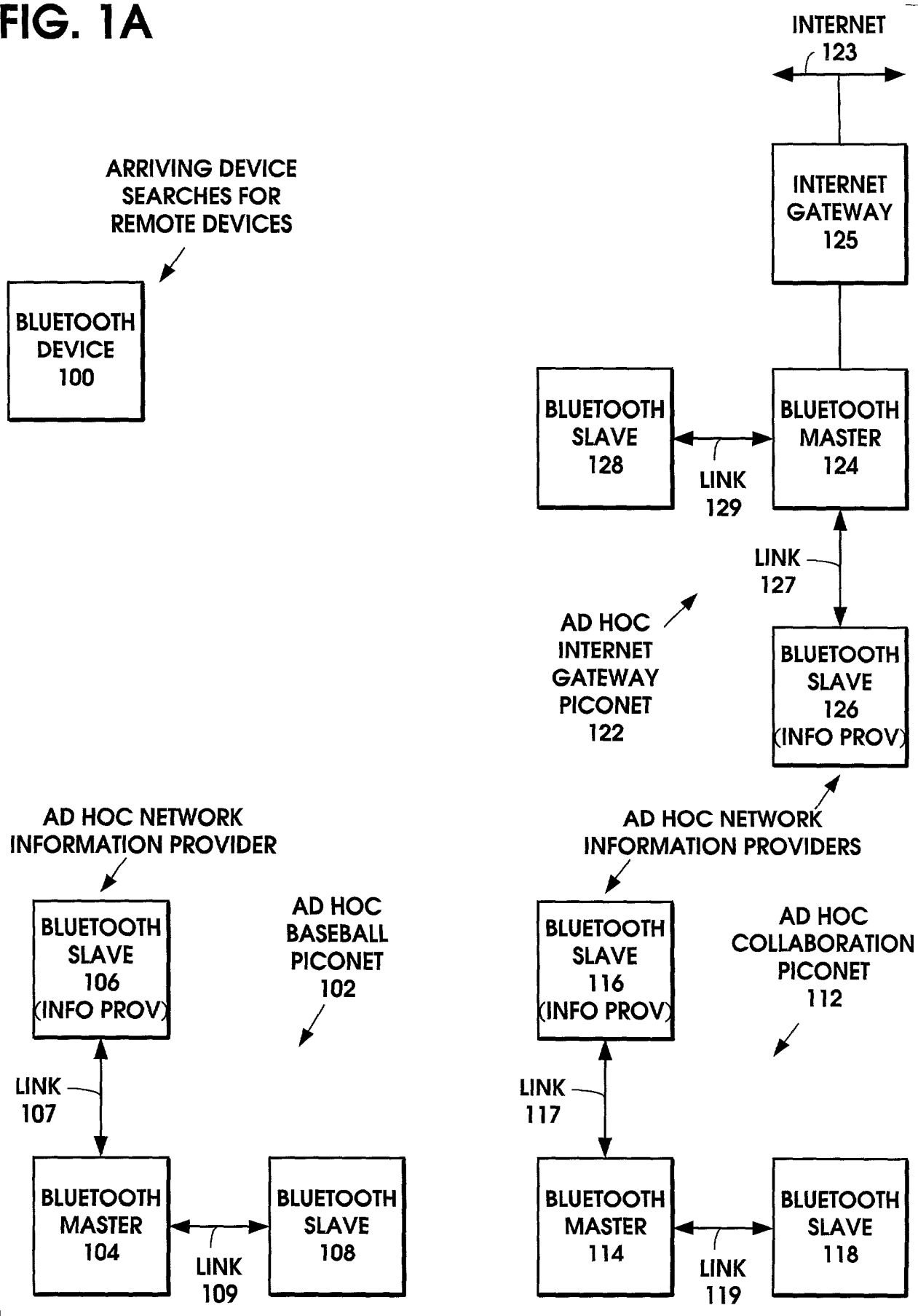

INTERNET
123
INTERNET GATEWAY 125
ARRIVING DEVICE SEARCHES FOR REMOTE DEVICES
BLUETOOTH DEVICE 100
BLUETOOTH SLAVE 128
LINK 129
BLUETOOTH MASTER 124
LINK 127
AD HOC INTERNET GATEWAY PICONET 122
BLUETOOTH SLAVE 126 (INFO PROV)
AD HOC NETWORK INFORMATION PROVIDER
AD HOC NETWORK INFORMATION PROVIDERS
BLUETOOTH SLAVE 106 (INFO PROV)
AD HOC BASEBALL PICONET 102
BLUETOOTH SLAVE 116 (INFO PROV)
AD HOC COLLABORATION PICONET 112
LINK 107
LINK 117
BLUETOOTH MASTER 104
LINK 109
BLUETOOTH SLAVE 108
BLUETOOTH MASTER 114
LINK 119
BLUETOOTH SLAVE 118

FIG. 1B

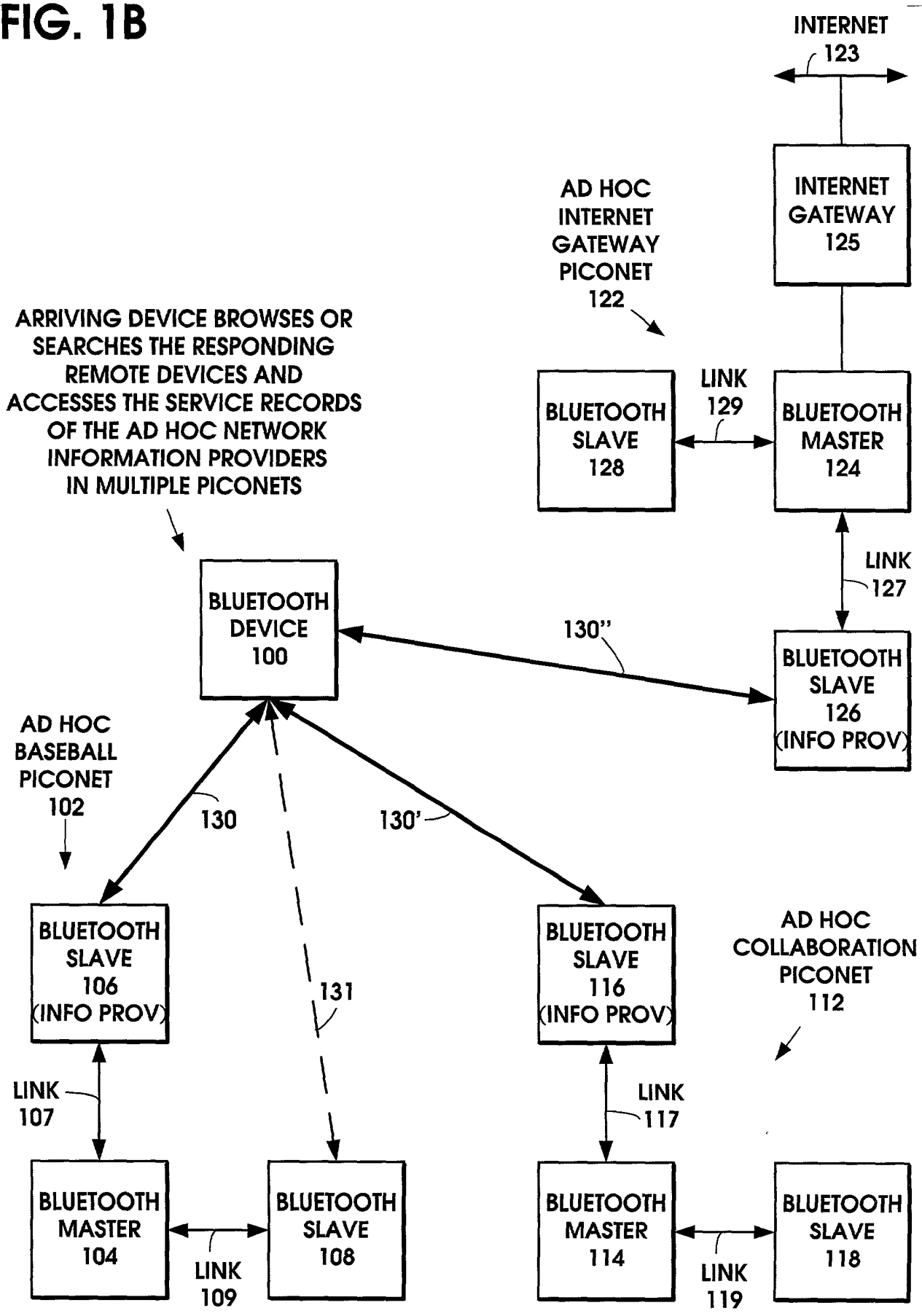

INTERNET
123
INTERNET GATEWAY 125
AD HOC INTERNET GATEWAY PICONET 122
ARRIVING DEVICE BROWSES OR SEARCHES THE RESPONDING REMOTE DEVICES AND ACCESSES THE SERVICE RECORDS OF THE AD HOC NETWORK INFORMATION PROVIDERS IN MULTIPLE PICONETS
BLUETOOTH SLAVE 128
LINK 129
BLUETOOTH MASTER 124
LINK 127
BLUETOOTH DEVICE 100
130"
BLUETOOTH SLAVE 126 (INFO PROV)
AD HOC BASEBALL PICONET 102
130
130'
131
BLUETOOTH SLAVE 106 (INFO PROV)
BLUETOOTH SLAVE 116 (INFO PROV)
AD HOC COLLABORATION PICONET 112
LINK 107
LINK 117
BLUETOOTH MASTER 104
LINK 109
BLUETOOTH SLAVE 108
BLUETOOTH MASTER 114
LINK 119
BLUETOOTH SLAVE 118

FIG. 1C

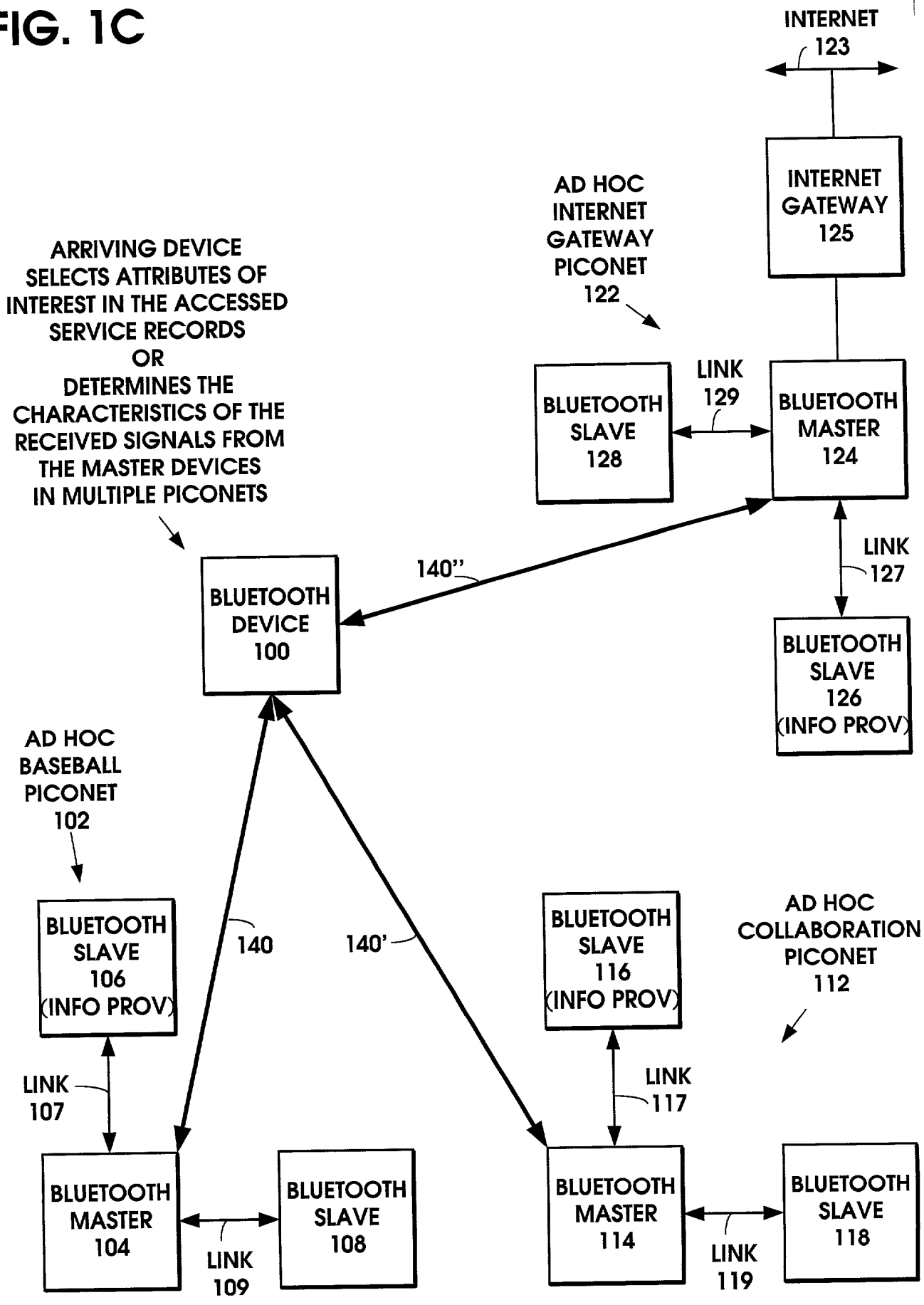

INTERNET
123
INTERNET GATEWAY 125
AD HOC INTERNET GATEWAY PICONET 122
ARRIVING DEVICE SELECTS ATTRIBUTES OF INTEREST IN THE ACCESSED SERVICE RECORDS OR DETERMINES THE CHARACTERISTICS OF THE RECEIVED SIGNALS FROM THE MASTER DEVICES IN MULTIPLE PICONETS
BLUETOOTH SLAVE 128
LINK 129
BLUETOOTH MASTER 124
LINK 127
140''
BLUETOOTH DEVICE 100
BLUETOOTH SLAVE 126 (INFO PROV)
AD HOC BASEBALL PICONET 102
BLUETOOTH SLAVE 106 (INFO PROV)
140
140'
BLUETOOTH SLAVE 116 (INFO PROV)
AD HOC COLLABORATION PICONET 112
LINK 107
LINK 117
BLUETOOTH MASTER 104
BLUETOOTH SLAVE 108
LINK 109
BLUETOOTH MASTER 114
LINK 119
BLUETOOTH SLAVE 118

FIG. 1D

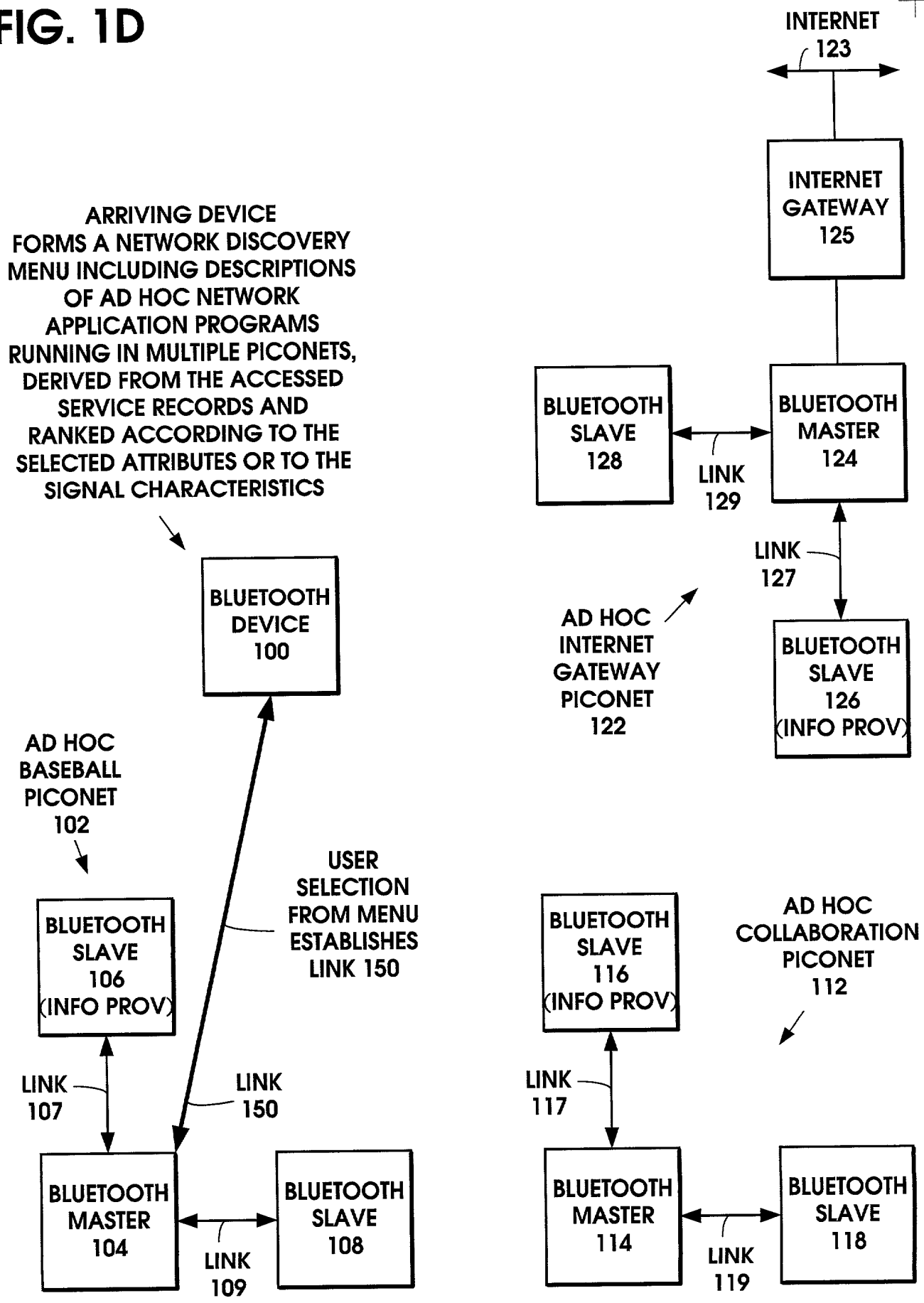

INTERNET
123
INTERNET GATEWAY 125
ARRIVING DEVICE FORMS A NETWORK DISCOVERY MENU INCLUDING DESCRIPTIONS OF AD HOC NETWORK APPLICATION PROGRAMS RUNNING IN MULTIPLE PICONETS, DERIVED FROM THE ACCESSED SERVICE RECORDS AND RANKED ACCORDING TO THE SELECTED ATTRIBUTES OR TO THE SIGNAL CHARACTERISTICS
BLUETOOTH SLAVE 128
LINK 129
BLUETOOTH MASTER 124
LINK 127
BLUETOOTH DEVICE 100
AD HOC INTERNET GATEWAY PICONET 122
BLUETOOTH SLAVE 126 (INFO PROV)
AD HOC BASEBALL PICONET 102
USER SELECTION FROM MENU ESTABLISHES LINK 150
BLUETOOTH SLAVE 106 (INFO PROV)
BLUETOOTH SLAVE 116 (INFO PROV)
AD HOC COLLABORATION PICONET 112
LINK 107
LINK 150
LINK 117
BLUETOOTH MASTER 104
BLUETOOTH SLAVE 108
BLUETOOTH MASTER 114
BLUETOOTH SLAVE 118
LINK 109
LINK 119

FIG. 1E

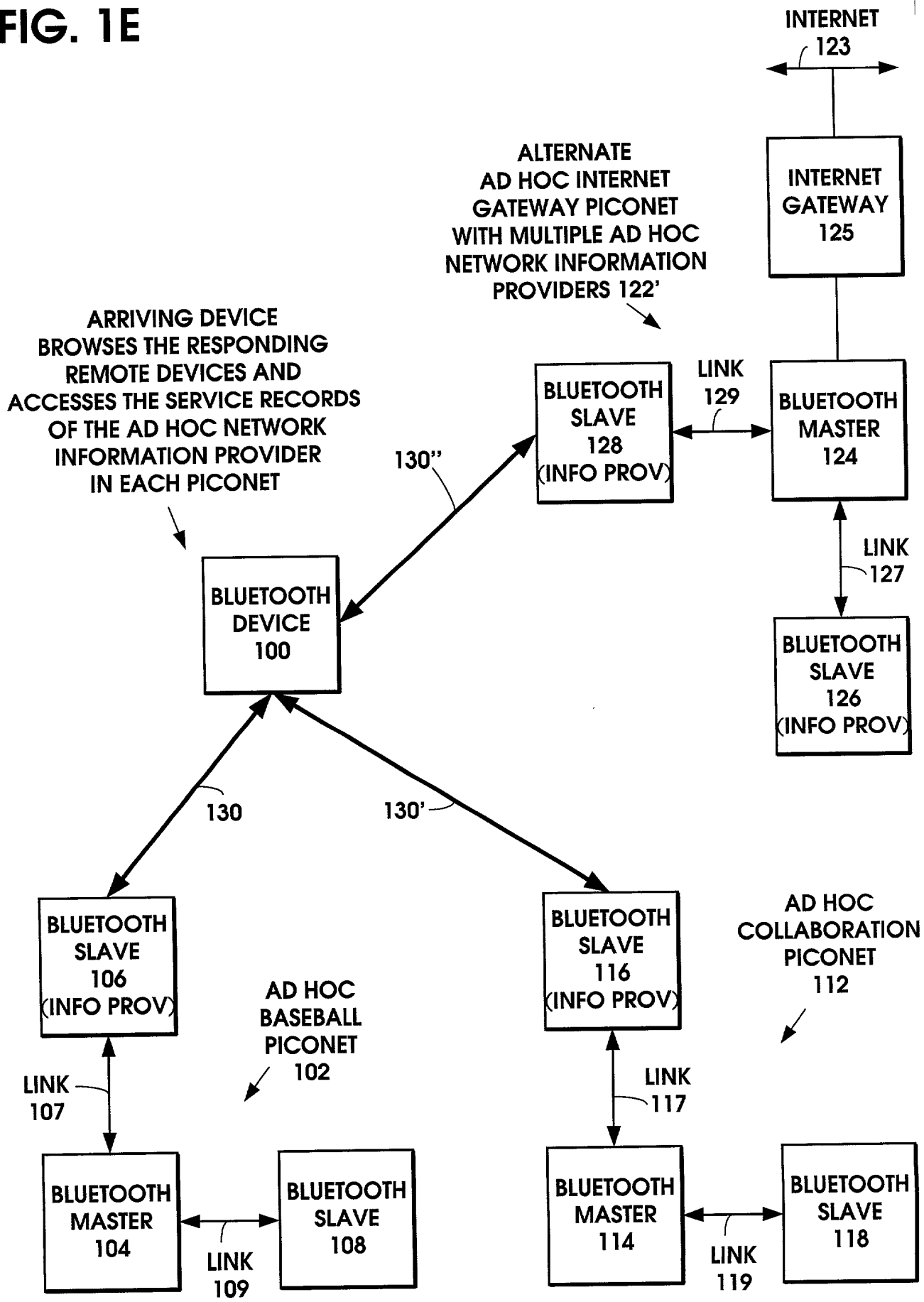

INTERNET
123
INTERNET GATEWAY 125
ALTERNATE AD HOC INTERNET GATEWAY PICONET WITH MULTIPLE AD HOC NETWORK INFORMATION PROVIDERS 122'
ARRIVING DEVICE BROWSES THE RESPONDING REMOTE DEVICES AND ACCESSES THE SERVICE RECORDS OF THE AD HOC NETWORK INFORMATION PROVIDER IN EACH PICONET
BLUETOOTH SLAVE 128 (INFO PROV)
LINK 129
BLUETOOTH MASTER 124
130''
BLUETOOTH DEVICE 100
LINK 127
BLUETOOTH SLAVE 126 (INFO PROV)
130
130'
BLUETOOTH SLAVE 106 (INFO PROV)
BLUETOOTH SLAVE 116 (INFO PROV)
AD HOC COLLABORATION PICONET 112
AD HOC BASEBALL PICONET 102
LINK 107
LINK 117
BLUETOOTH MASTER 104
BLUETOOTH SLAVE 108
LINK 109
BLUETOOTH MASTER 114
BLUETOOTH SLAVE 118
LINK 119

FIG. 1F

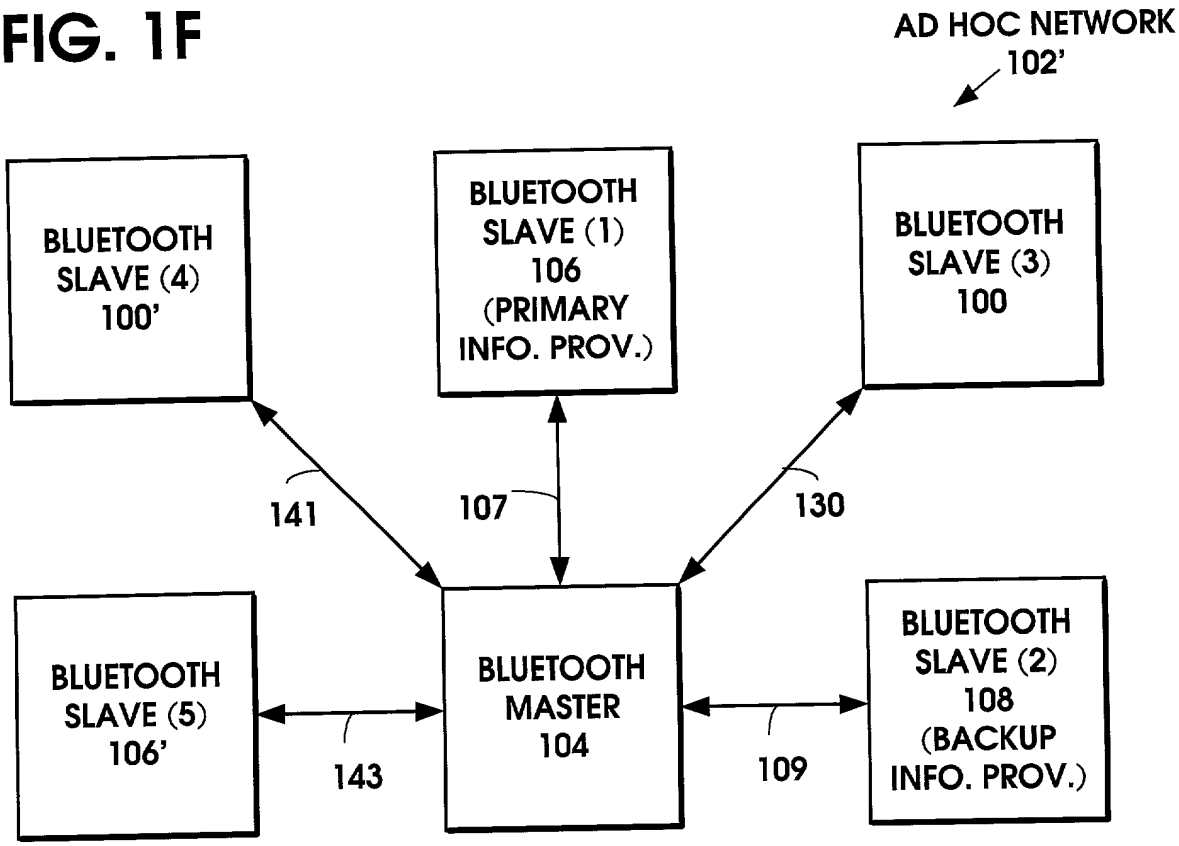

AD HOC NETWORK
102'
BLUETOOTH SLAVE (4) 100'
BLUETOOTH SLAVE (1) 106 (PRIMARY INFO. PROV.)
BLUETOOTH SLAVE (3) 100
141
107
130
BLUETOOTH SLAVE (5) 106'
BLUETOOTH MASTER 104
BLUETOOTH SLAVE (2) 108 (BACKUP INFO. PROV.)
143
109

FIG. 1G

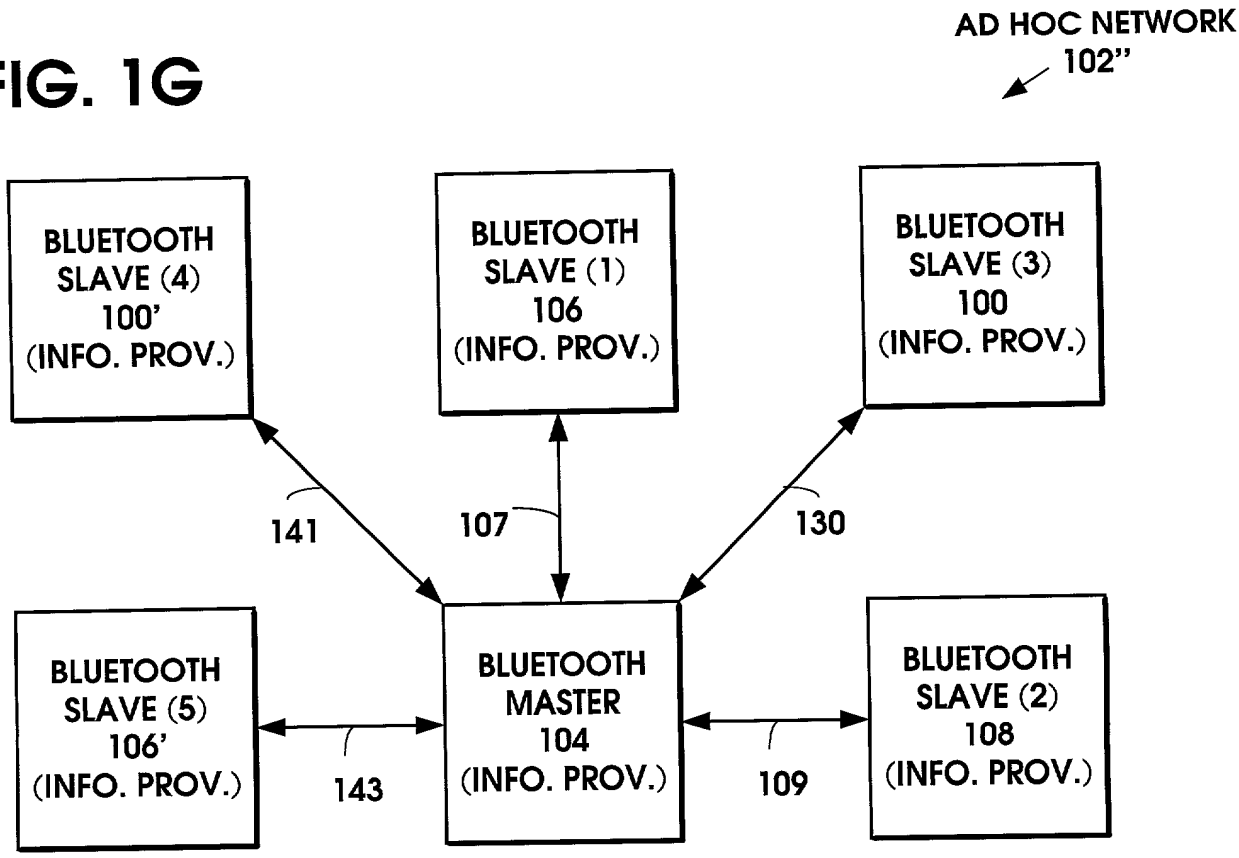
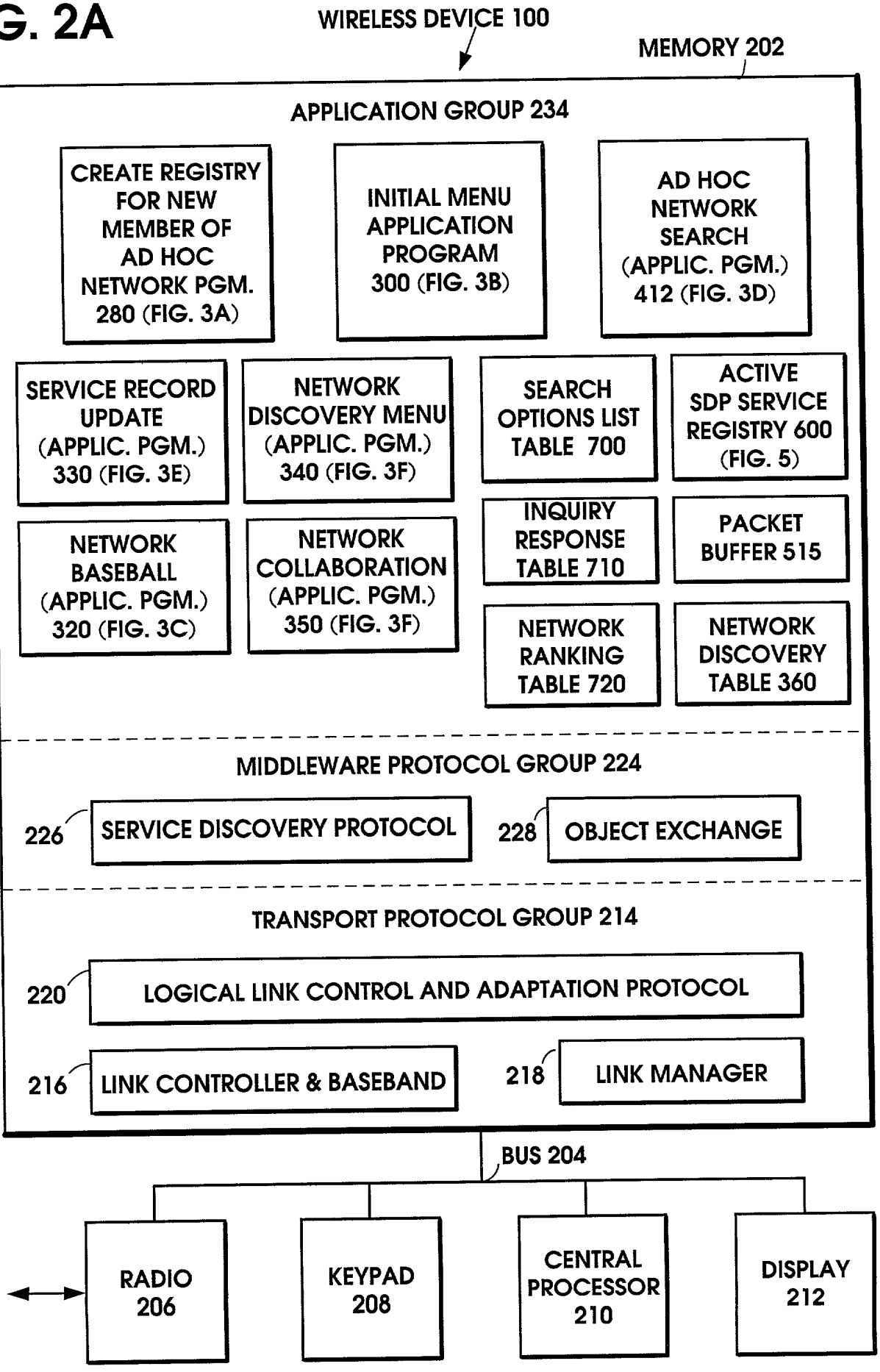

AD HOC NETWORK
102''
BLUETOOTH SLAVE (4) 100' (INFO. PROV.)
BLUETOOTH SLAVE (1) 106 (INFO. PROV.)
BLUETOOTH SLAVE (3) 100 (INFO. PROV.)
141
107
130
BLUETOOTH SLAVE (5) 106' (INFO. PROV.)
BLUETOOTH MASTER 104 (INFO. PROV.)
BLUETOOTH SLAVE (2) 108 (INFO. PROV.)
143
109

FIG. 2A


WIRELESS DEVICE 100
MEMORY 202
APPLICATION GROUP 234
CREATE REGISTRY FOR NEW MEMBER OF AD HOC NETWORK PGM. 280 (FIG. 3A)
INITIAL MENU APPLICATION PROGRAM 300 (FIG. 3B)
AD HOC NETWORK SEARCH (APPLIC. PGM.) 412 (FIG. 3D)
SERVICE RECORD UPDATE (APPLIC. PGM.) 330 (FIG. 3E)
NETWORK DISCOVERY MENU (APPLIC. PGM.) 340 (FIG. 3F)
SEARCH OPTIONS LIST TABLE 700
ACTIVE SDP SERVICE REGISTRY 600 (FIG. 5)
NETWORK BASEBALL (APPLIC. PGM.) 320 (FIG. 3C)
NETWORK COLLABORATION (APPLIC. PGM.) 350 (FIG. 3F)
INQUIRY RESPONSE TABLE 710
PACKET BUFFER 515
NETWORK RANKING TABLE 720
NETWORK DISCOVERY TABLE 360
MIDDLEWARE PROTOCOL GROUP 224
226
SERVICE DISCOVERY PROTOCOL
228
OBJECT EXCHANGE
TRANSPORT PROTOCOL GROUP 214
220
LOGICAL LINK CONTROL AND ADAPTATION PROTOCOL
216
LINK CONTROLLER & BASEBAND
218
LINK MANAGER
BUS 204
RADIO 206
KEYPAD 208
CENTRAL PROCESSOR 210
DISPLAY 212

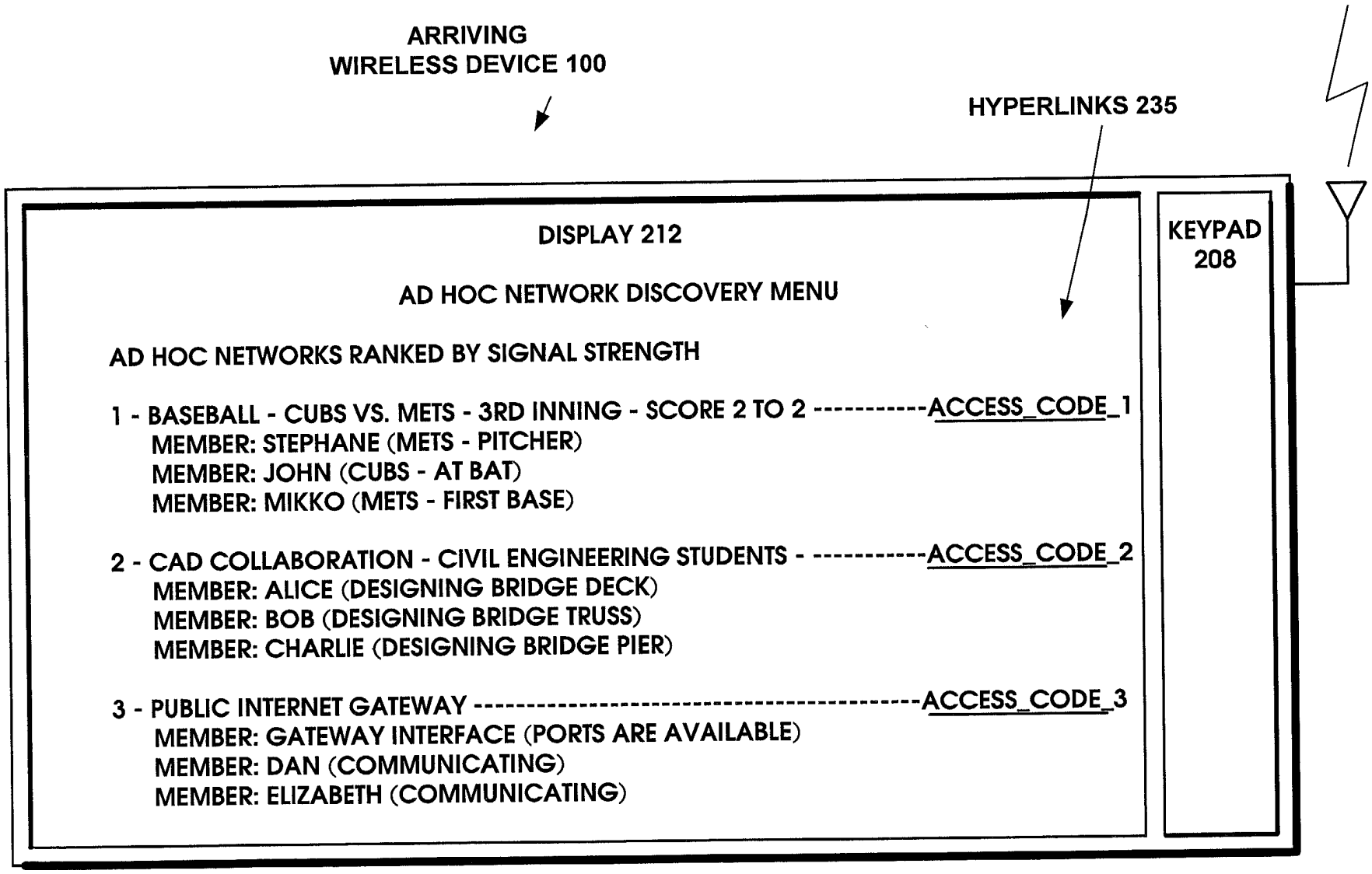


FIG. 2B

Mikko Oikkonen, Kai Nyman, Stephane Bouet
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28377 (4208-4003)

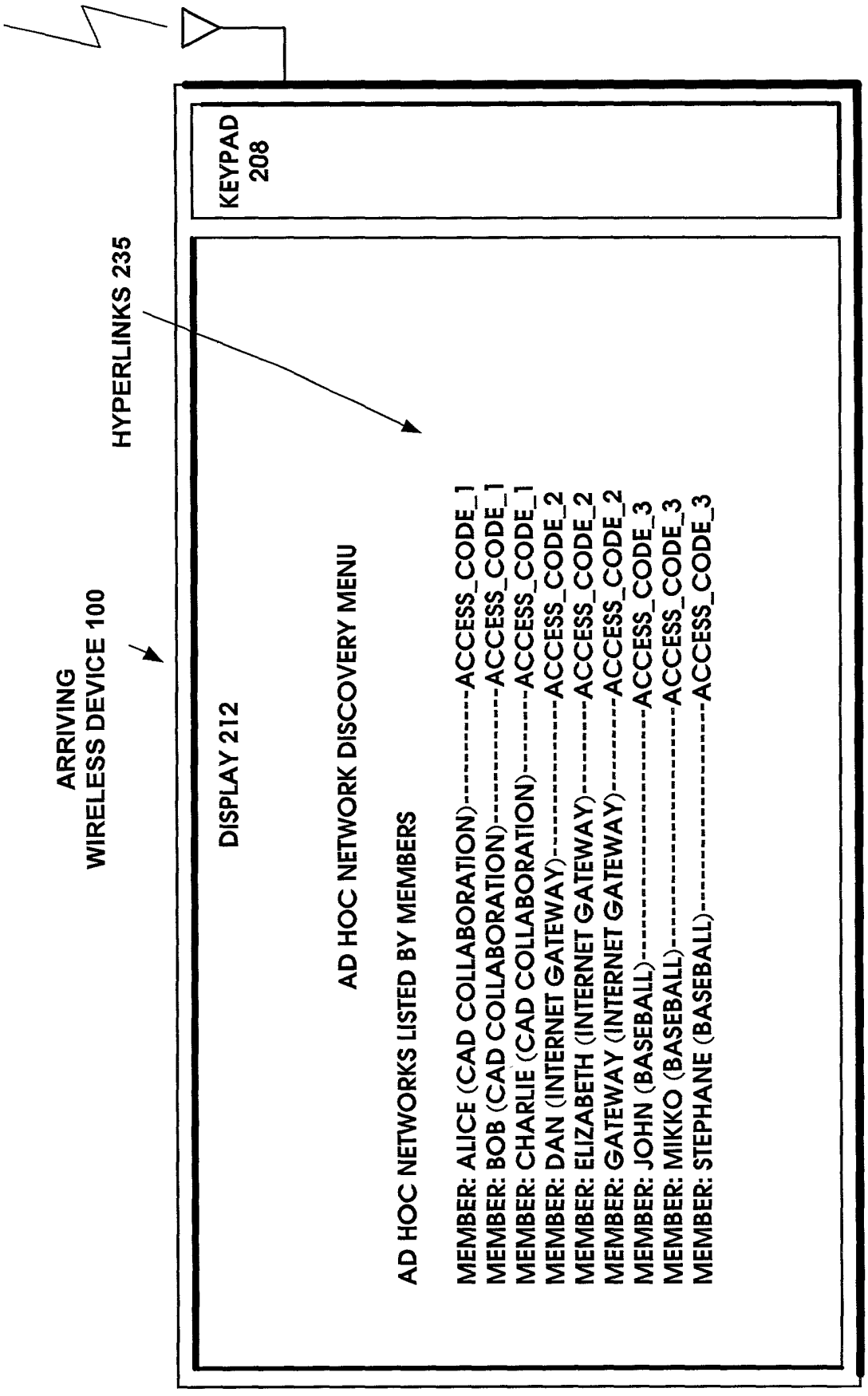

ARRIVING
WIRELESS DEVICE 100
HYPERLINKS 235
DISPLAY 212
KEYPAD
208
AD HOC NETWORK DISCOVERY MENU
AD HOC NETWORKS LISTED BY MEMBERS
MEMBER: ALICE (CAD COLLABORATION)----------ACCESS_CODE_1
MEMBER: BOB (CAD COLLABORATION)----------ACCESS_CODE_1
MEMBER: CHARLIE (CAD COLLABORATION)----------ACCESS_CODE_1
MEMBER: DAN (INTERNET GATEWAY)----------ACCESS_CODE_2
MEMBER: ELIZABETH (INTERNET GATEWAY)----------ACCESS_CODE_2
MEMBER: GATEWAY (INTERNET GATEWAY)----------ACCESS_CODE_2
MEMBER: JOHN (BASEBALL)----------ACCESS_CODE_3
MEMBER: MIKKO (BASEBALL)----------ACCESS_CODE_3
MEMBER: STEPHANE (BASEBALL)----------ACCESS_CODE_3

FIG. 2C

FIG. 3

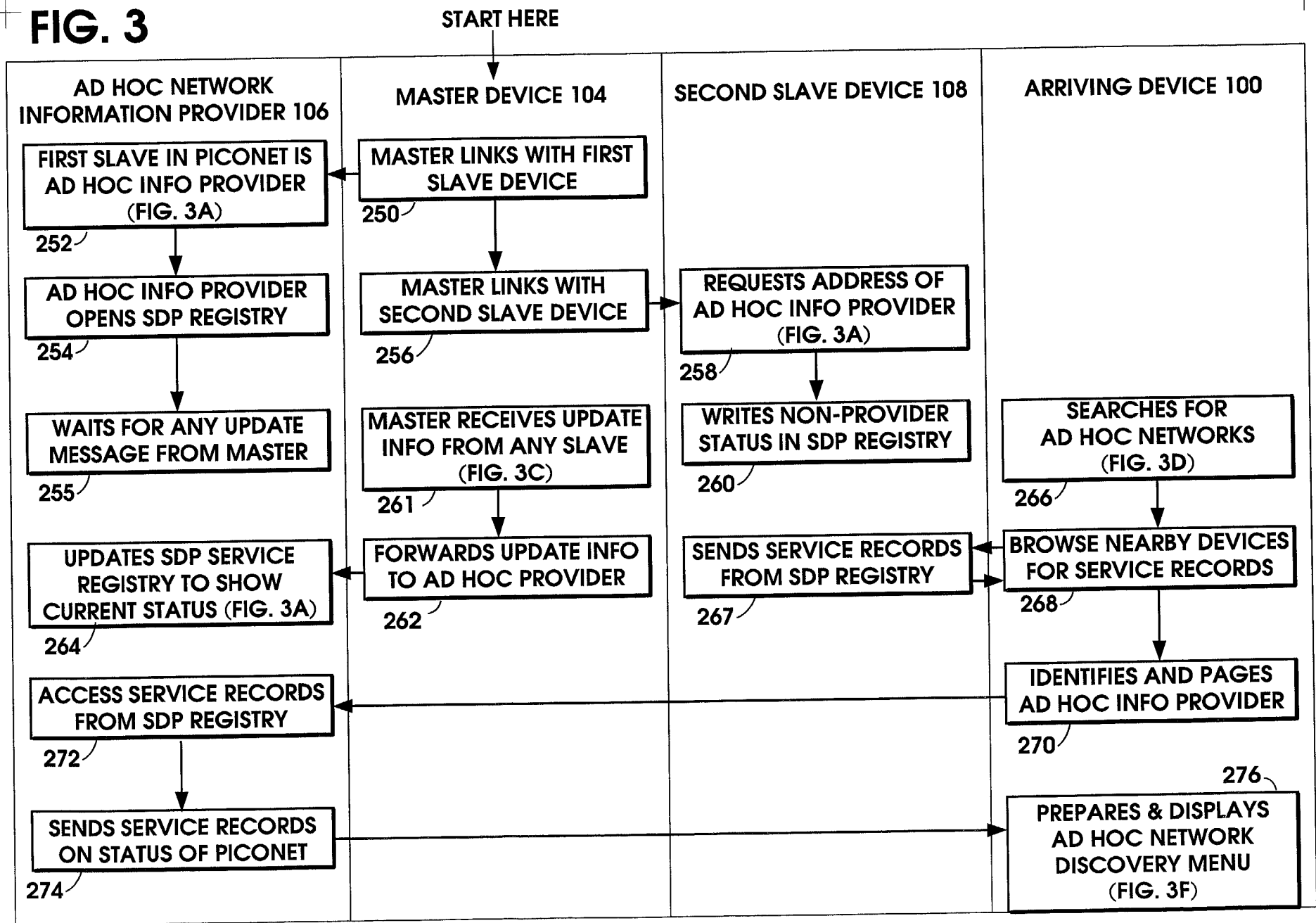


FIG. 3A

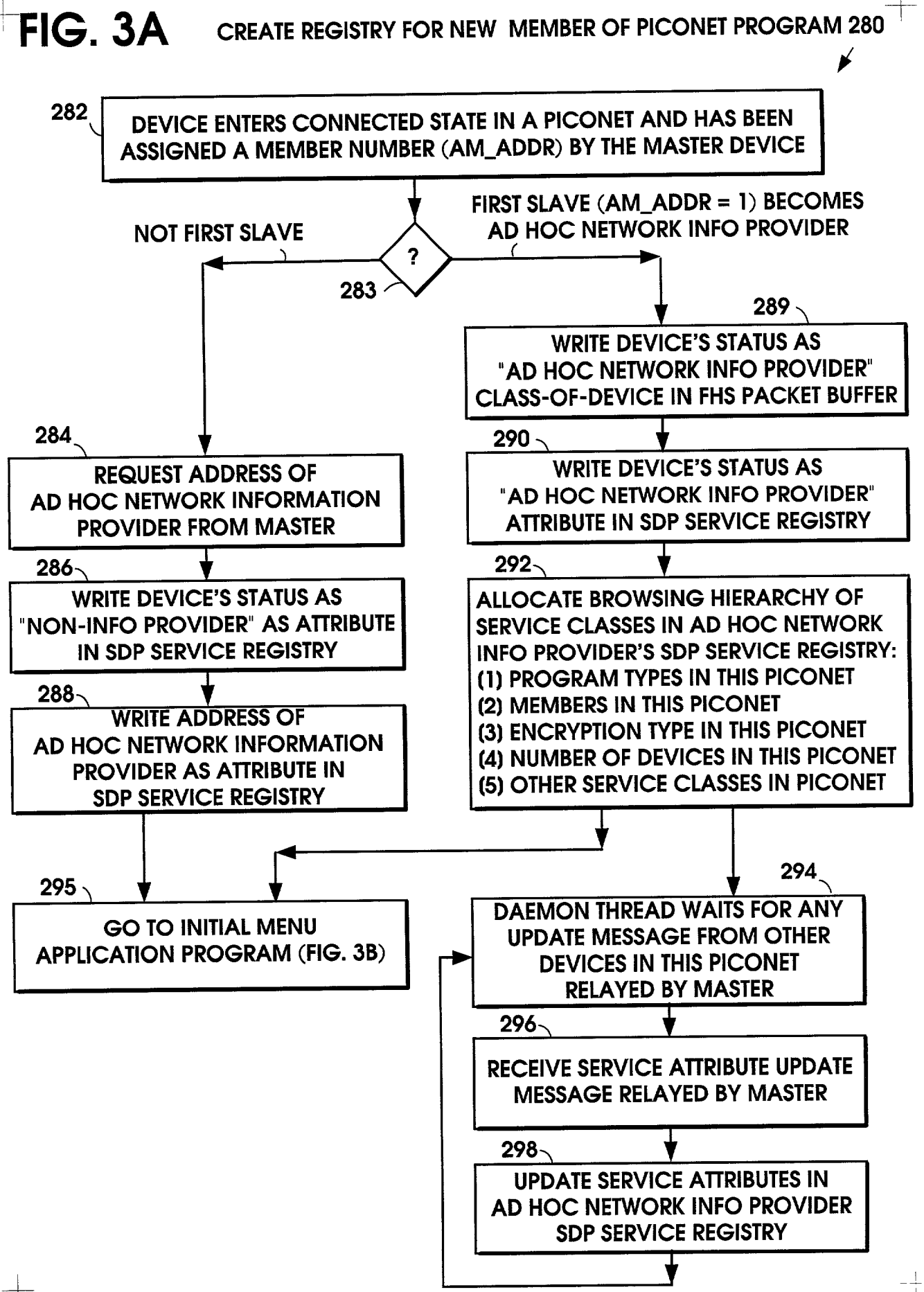

CREATE REGISTRY FOR NEW MEMBER OF PICONET PROGRAM 280
282
DEVICE ENTERS CONNECTED STATE IN A PICONET AND HAS BEEN ASSIGNED A MEMBER NUMBER (AM_ADDR) BY THE MASTER DEVICE
NOT FIRST SLAVE
?
283
FIRST SLAVE (AM_ADDR = 1) BECOMES AD HOC NETWORK INFO PROVIDER
289
WRITE DEVICE'S STATUS AS "AD HOC NETWORK INFO PROVIDER" CLASS-OF-DEVICE IN FHS PACKET BUFFER
284
REQUEST ADDRESS OF AD HOC NETWORK INFORMATION PROVIDER FROM MASTER
290
WRITE DEVICE'S STATUS AS "AD HOC NETWORK INFO PROVIDER" ATTRIBUTE IN SDP SERVICE REGISTRY
286
WRITE DEVICE'S STATUS AS "NON-INFO PROVIDER" AS ATTRIBUTE IN SDP SERVICE REGISTRY
292
ALLOCATE BROWSING HIERARCHY OF SERVICE CLASSES IN AD HOC NETWORK INFO PROVIDER'S SDP SERVICE REGISTRY:
(1) PROGRAM TYPES IN THIS PICONET
(2) MEMBERS IN THIS PICONET
(3) ENCRYPTION TYPE IN THIS PICONET
(4) NUMBER OF DEVICES IN THIS PICONET
(5) OTHER SERVICE CLASSES IN PICONET
288
WRITE ADDRESS OF AD HOC NETWORK INFORMATION PROVIDER AS ATTRIBUTE IN SDP SERVICE REGISTRY
295
GO TO INITIAL MENU APPLICATION PROGRAM (FIG. 3B)
294
DAEMON THREAD WAITS FOR ANY UPDATE MESSAGE FROM OTHER DEVICES IN THIS PICONET RELAYED BY MASTER
296
RECEIVE SERVICE ATTRIBUTE UPDATE MESSAGE RELAYED BY MASTER
298
UPDATE SERVICE ATTRIBUTES IN AD HOC NETWORK INFO PROVIDER SDP SERVICE REGISTRY

FIG. 3B

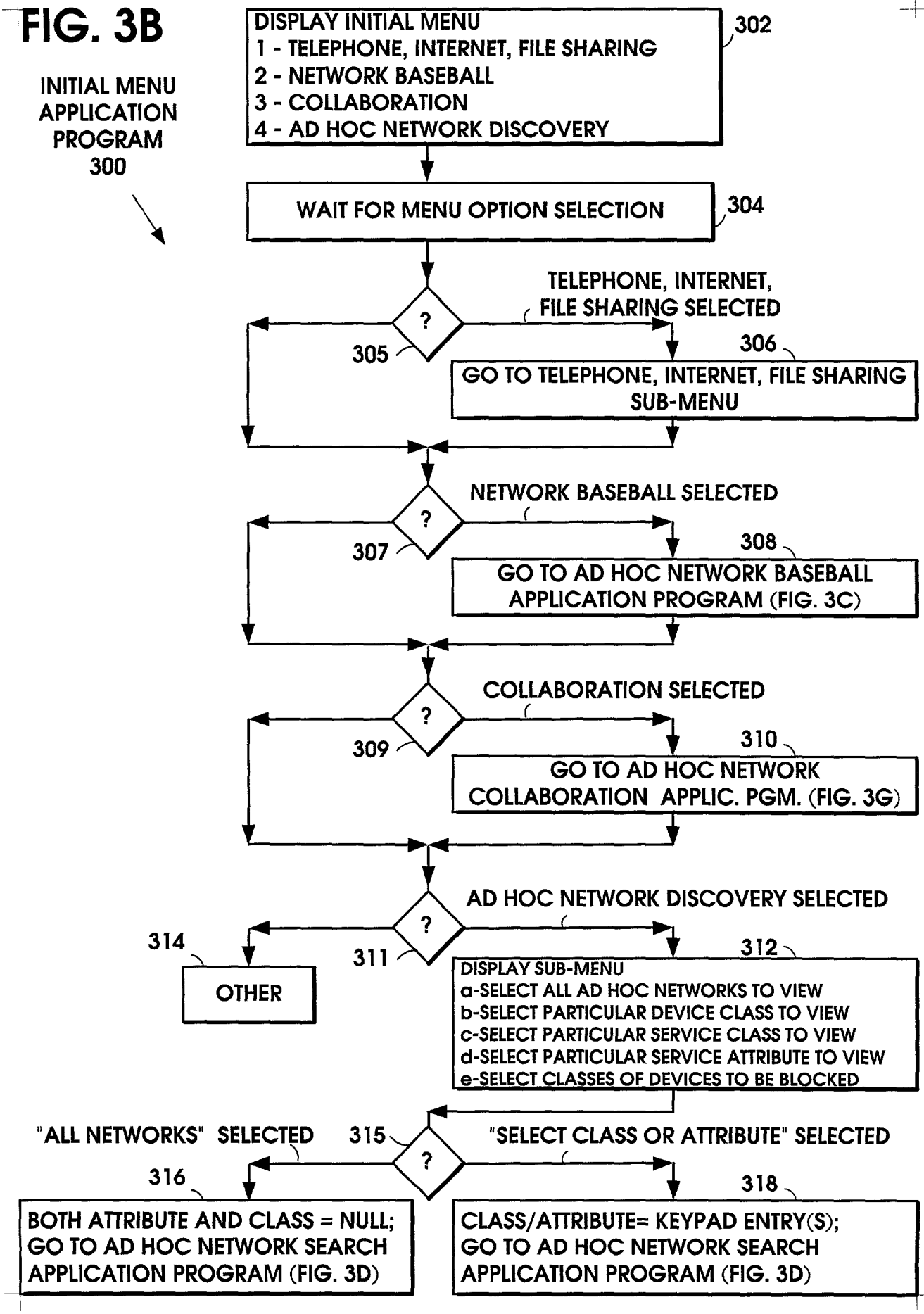

INITIAL MENU APPLICATION PROGRAM 300
DISPLAY INITIAL MENU
1 - TELEPHONE, INTERNET, FILE SHARING
2 - NETWORK BASEBALL
3 - COLLABORATION
4 - AD HOC NETWORK DISCOVERY
302
WAIT FOR MENU OPTION SELECTION
304
TELEPHONE, INTERNET, FILE SHARING SELECTED
305
306
GO TO TELEPHONE, INTERNET, FILE SHARING SUB-MENU
NETWORK BASEBALL SELECTED
307
308
GO TO AD HOC NETWORK BASEBALL APPLICATION PROGRAM (FIG. 3C)
COLLABORATION SELECTED
309
310
GO TO AD HOC NETWORK COLLABORATION APPLIC. PGM. (FIG. 3G)
AD HOC NETWORK DISCOVERY SELECTED
311
312
314
OTHER
DISPLAY SUB-MENU
a-SELECT ALL AD HOC NETWORKS TO VIEW
b-SELECT PARTICULAR DEVICE CLASS TO VIEW
c-SELECT PARTICULAR SERVICE CLASS TO VIEW
d-SELECT PARTICULAR SERVICE ATTRIBUTE TO VIEW
e-SELECT CLASSES OF DEVICES TO BE BLOCKED
"ALL NETWORKS" SELECTED
315
"SELECT CLASS OR ATTRIBUTE" SELECTED
316
318
BOTH ATTRIBUTE AND CLASS = NULL; GO TO AD HOC NETWORK SEARCH APPLICATION PROGRAM (FIG. 3D)
CLASS/ATTRIBUTE= KEYPAD ENTRY(S); GO TO AD HOC NETWORK SEARCH APPLICATION PROGRAM (FIG. 3D)

FIG. 3C

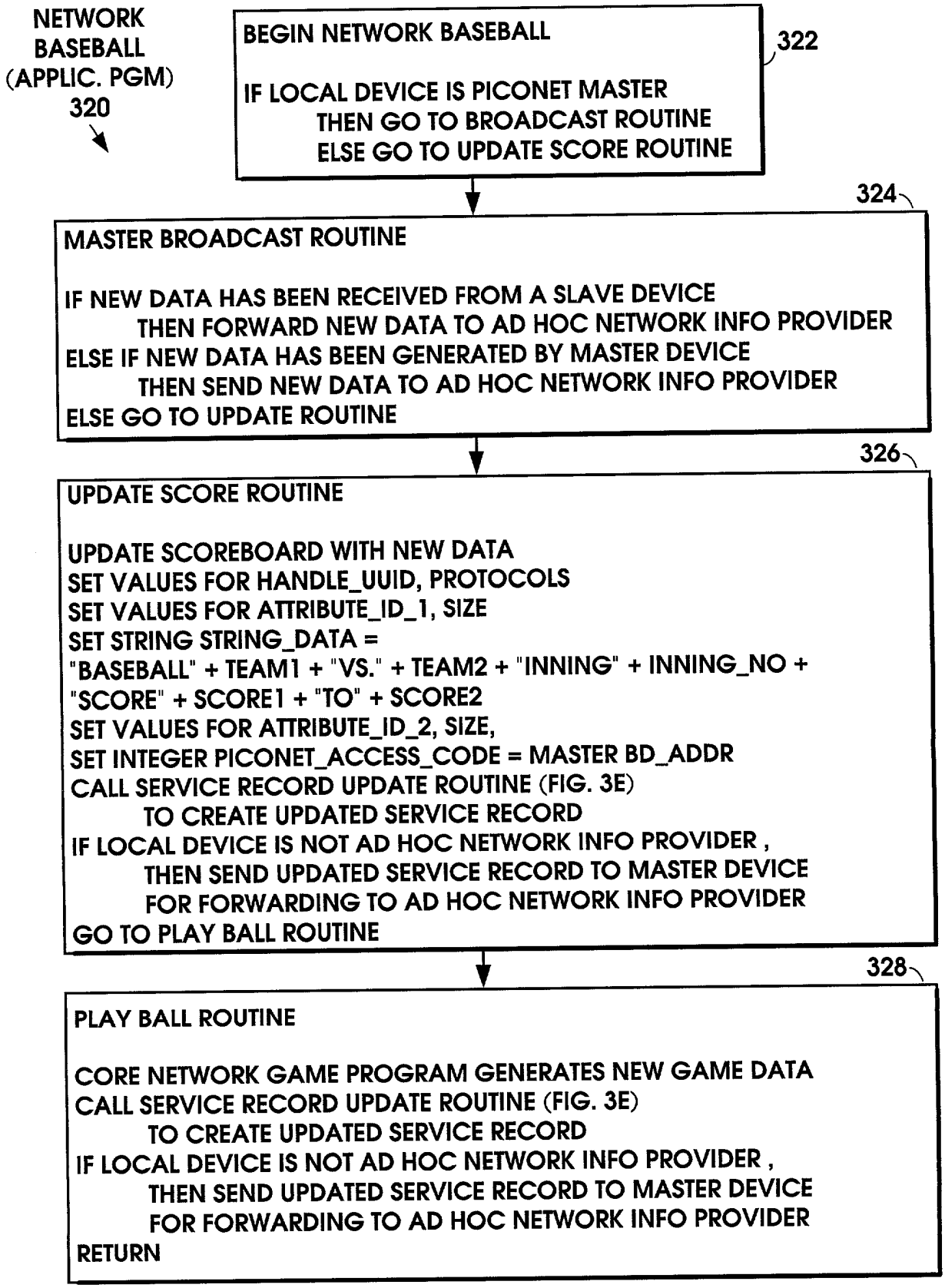

NETWORK BASEBALL (APPLIC. PGM) 320
BEGIN NETWORK BASEBALL
IF LOCAL DEVICE IS PICONET MASTER
THEN GO TO BROADCAST ROUTINE
ELSE GO TO UPDATE SCORE ROUTINE
322
324
MASTER BROADCAST ROUTINE
IF NEW DATA HAS BEEN RECEIVED FROM A SLAVE DEVICE
THEN FORWARD NEW DATA TO AD HOC NETWORK INFO PROVIDER
ELSE IF NEW DATA HAS BEEN GENERATED BY MASTER DEVICE
THEN SEND NEW DATA TO AD HOC NETWORK INFO PROVIDER
ELSE GO TO UPDATE ROUTINE
326
UPDATE SCORE ROUTINE
UPDATE SCOREBOARD WITH NEW DATA
SET VALUES FOR HANDLE_UUID, PROTOCOLS
SET VALUES FOR ATTRIBUTE_ID_1, SIZE
SET STRING STRING_DATA =
"BASEBALL" + TEAM1 + "VS." + TEAM2 + "INNING" + INNING_NO +
"SCORE" + SCORE1 + "TO" + SCORE2
SET VALUES FOR ATTRIBUTE_ID_2, SIZE,
SET INTEGER PICONET_ACCESS_CODE = MASTER BD_ADDR
CALL SERVICE RECORD UPDATE ROUTINE (FIG. 3E)
TO CREATE UPDATED SERVICE RECORD
IF LOCAL DEVICE IS NOT AD HOC NETWORK INFO PROVIDER ,
THEN SEND UPDATED SERVICE RECORD TO MASTER DEVICE
FOR FORWARDING TO AD HOC NETWORK INFO PROVIDER
GO TO PLAY BALL ROUTINE
328
PLAY BALL ROUTINE
CORE NETWORK GAME PROGRAM GENERATES NEW GAME DATA
CALL SERVICE RECORD UPDATE ROUTINE (FIG. 3E)
TO CREATE UPDATED SERVICE RECORD
IF LOCAL DEVICE IS NOT AD HOC NETWORK INFO PROVIDER ,
THEN SEND UPDATED SERVICE RECORD TO MASTER DEVICE
FOR FORWARDING TO AD HOC NETWORK INFO PROVIDER
RETURN

FIG. 3D

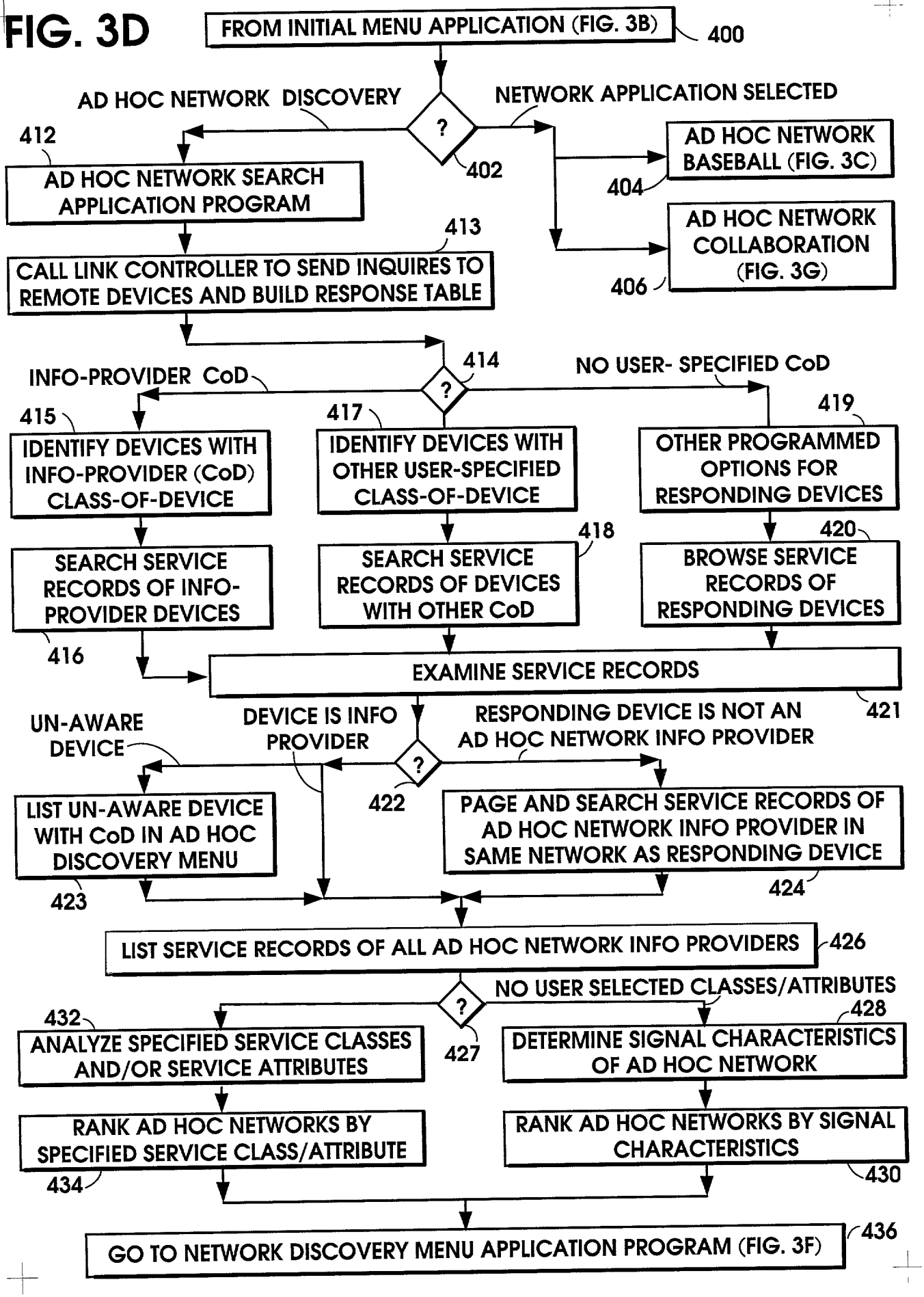

FROM INITIAL MENU APPLICATION (FIG. 3B)
400
AD HOC NETWORK DISCOVERY
?
NETWORK APPLICATION SELECTED
402
412
AD HOC NETWORK SEARCH APPLICATION PROGRAM
AD HOC NETWORK BASEBALL (FIG. 3C)
404
AD HOC NETWORK COLLABORATION (FIG. 3G)
406
413
CALL LINK CONTROLLER TO SEND INQUIRES TO REMOTE DEVICES AND BUILD RESPONSE TABLE
414
INFO-PROVIDER CoD
?
NO USER- SPECIFIED CoD
415
IDENTIFY DEVICES WITH INFO-PROVIDER (CoD) CLASS-OF-DEVICE
417
IDENTIFY DEVICES WITH OTHER USER-SPECIFIED CLASS-OF-DEVICE
419
OTHER PROGRAMMED OPTIONS FOR RESPONDING DEVICES
SEARCH SERVICE RECORDS OF INFO-PROVIDER DEVICES
416
418
SEARCH SERVICE RECORDS OF DEVICES WITH OTHER CoD
420
BROWSE SERVICE RECORDS OF RESPONDING DEVICES
EXAMINE SERVICE RECORDS
421
UN-AWARE DEVICE
DEVICE IS INFO PROVIDER
?
RESPONDING DEVICE IS NOT AN AD HOC NETWORK INFO PROVIDER
422
LIST UN-AWARE DEVICE WITH CoD IN AD HOC DISCOVERY MENU
423
PAGE AND SEARCH SERVICE RECORDS OF AD HOC NETWORK INFO PROVIDER IN SAME NETWORK AS RESPONDING DEVICE
424
LIST SERVICE RECORDS OF ALL AD HOC NETWORK INFO PROVIDERS
426
?
NO USER SELECTED CLASSES/ATTRIBUTES
427
432
ANALYZE SPECIFIED SERVICE CLASSES AND/OR SERVICE ATTRIBUTES
428
DETERMINE SIGNAL CHARACTERISTICS OF AD HOC NETWORK
RANK AD HOC NETWORKS BY SPECIFIED SERVICE CLASS/ATTRIBUTE
434
RANK AD HOC NETWORKS BY SIGNAL CHARACTERISTICS
430
GO TO NETWORK DISCOVERY MENU APPLICATION PROGRAM (FIG. 3F)
436

FIG. 3E

SERVICE RECORD
UPDATE
(APPLIC. PGM)
330

SERVICE RECORD UPDATE ROUTINE

SET VALUES FROM LOCAL AD HOC NETWORK APPLICATION PROGRAM
ServiceRecordHandle = HANDLE_UUID
ServiceClass = "NETWORK_SERVICE"
ProtocolDescriptorList = PROTOCOLS
AttributeIdentifier1 = ATTRIBUTE_ID_1
AttributeType1 = "STRING"
AttributeSize1 = SIZE
AttributeData1 = STRING_DATA
AttributeIdentifier2 = ATTRIBUTE_ID_2
AttributeType2 = "INTEGER"
AttributeSize2 = SIZE
AttributeData2 = PICONET_ACCESS_CODE

WRITE UPDATED SERVICE RECORD TO LOCAL SDP SERVICE REGISTRY AS
ServiceRecordHandle / ServiceClass / ProtocolDescriptorList /
AttributeIdentifier1 / AttributeType1 / AttributeSize1 / AttributeData1 /
AttributeIdentifier2 / AttributeType2 / AttributeSize2 / AttributeData2

RETURN

FIG. 3F

340

```
BEGIN NETWORK DISCOVERY MENU APPLICATION IN ARRIVING DEVICE

DISPLAY NETWORK DISCOVERY MENU
OPTION      STRING
1           "BASEBALL CUBS VS. METS 3RD INNING SCORE 2 TO 2"
2           "CAD COLLABORATION NEED HELP DESIGNING BRIDGE TRUSS"
3           "INDIVIDUALS CONNECTED TO INTERNET GATEWAY DEVICE"
WAIT FOR SELECTION
IF OPTION = 1 THEN
SEND PAGE TO AD HOC BASEBALL PICONET MASTER DEVICE
      USING AD HOC BASEBALL PICONET_ACCESS_CODE
RECEIVE ID PACKET FROM AD HOC BASEBALL MASTER DEVICE
      WHICH ASSUMES TEMPORARY ROLE AS REMOTE SLAVE
      TO ARRIVING DEVICE WHICH ASSUMES TEMPORARY ROLE AS
      MASTER IN A TEMPORARY NEW PICONET
SET UP LINK BETWEEN ARRIVING DEVICE AND REMOTE DEVICE
REQUEST BY ARRIVING DEVICE TO SWITCH MASTER/SLAVE ROLES
ARRIVING DEVICE BECOMES SLAVE AND REMOTE DEVICE RESUMES
      MASTER ROLE IN AD HOC BASEBALL PICONET

ELSE IF OPTION = 2 THEN
SEND PAGE TO AD HOC COLLABORATION PICONET MASTER DEVICE
      USING AD HOC COLLABORATION PICONET_ACCESS_CODE
RECEIVE ID PACKET FROM AD HOC COLLABORATION MASTER
SET UP LINK BETWEEN ARRIVING DEVICE AND REMOTE DEVICE
REQUEST BY ARRIVING DEVICE TO SWITCH MASTER/SLAVE ROLES
ARRIVING DEVICE BECOMES SLAVE AND REMOTE DEVICE RESUMES
      MASTER ROLE IN AD HOC COLLABORATION PICONET

ELSE IF OPTION = 3 THEN
SEND PAGE TO AD HOC INTERNET GATEWAY PICONET MASTER DEVICE
      USING AD HOC INTERNET GATEWAY PICONET_ACCESS_CODE
RECEIVE ID PACKET FROM AD HOC INTERNET GATEWAY MASTER
SET UP LINK BETWEEN ARRIVING DEVICE AND REMOTE DEVICE
REQUEST BY ARRIVING DEVICE TO SWITCH MASTER/SLAVE ROLES
ARRIVING DEVICE BECOMES SLAVE AND REMOTE DEVICE RESUMES
MASTER ROLE IN AD HOC INTERNET GATEWAY PICONET

ELSE RETURN
```

FIG. 3G

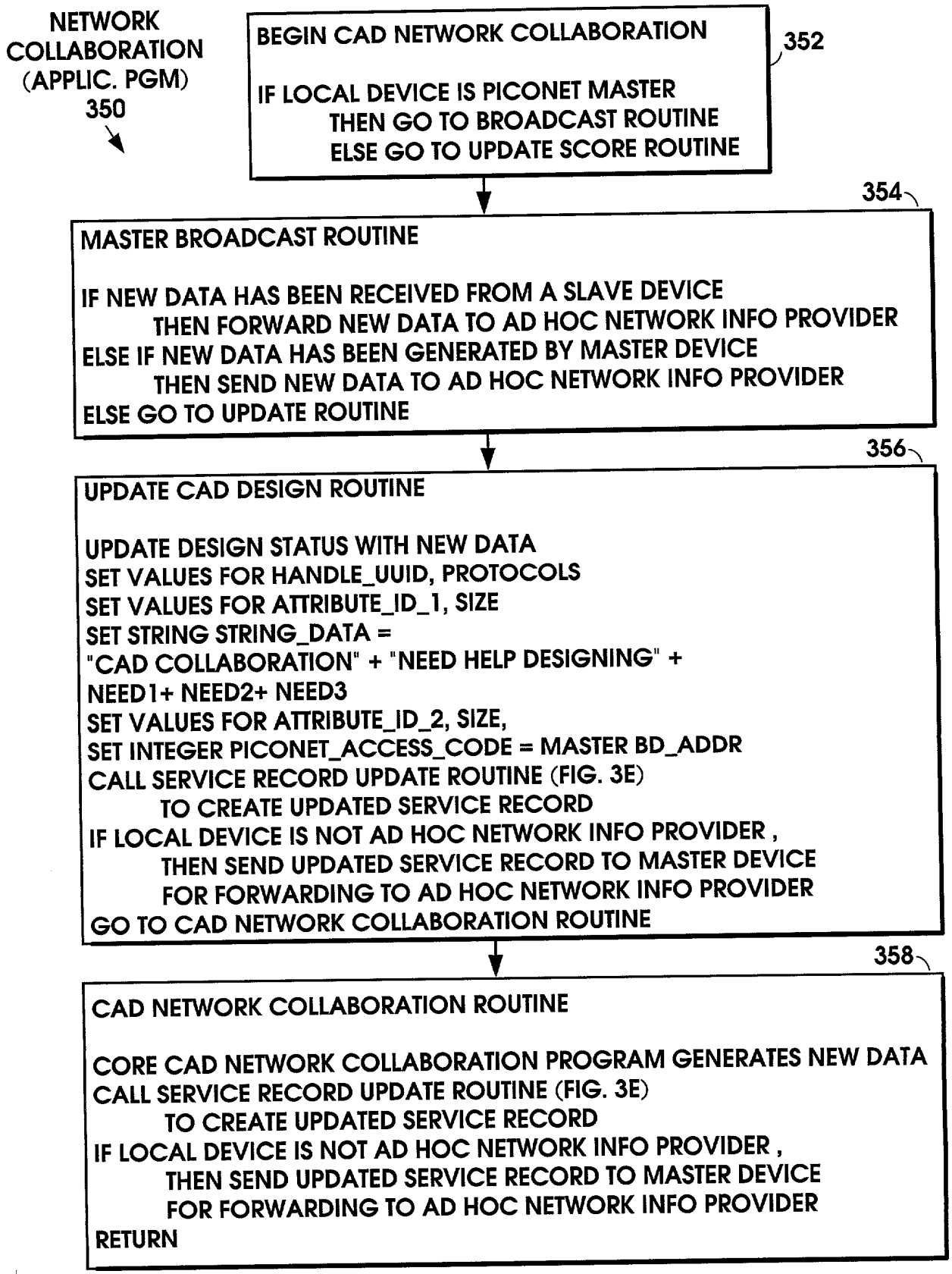


FIG. 4A

BLUETOOTH PACKET STRUCTURE FOR AN INQUIRY PACKET SENT BY ARRIVING DEVICE 100

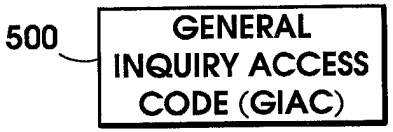
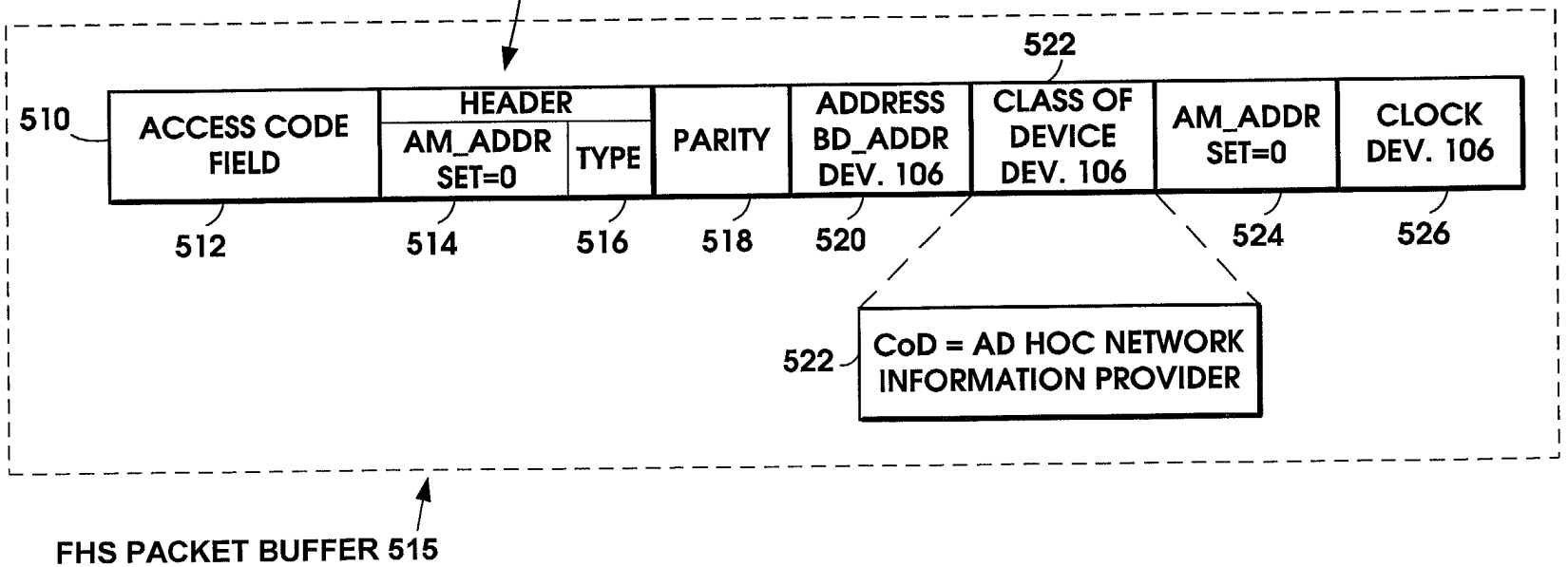


FIG. 4B

BLUETOOTH FHS PACKET STRUCTURE FOR AN INQUIRY RESPONSE PACKET SENT BY AD HOC NETWORK INFORMATION PROVIDER 106



Mikko Olkkonen, Kai Nyman, Stephane Bouet
AD HOC NETWORKING DISCOVERY MENU
28377 (4208-4003)

FIG. 4C

BLUETOOTH PACKET STRUCTURE
FOR A PAGING PACKET
SENT BY ARRIVING DEVICE 100

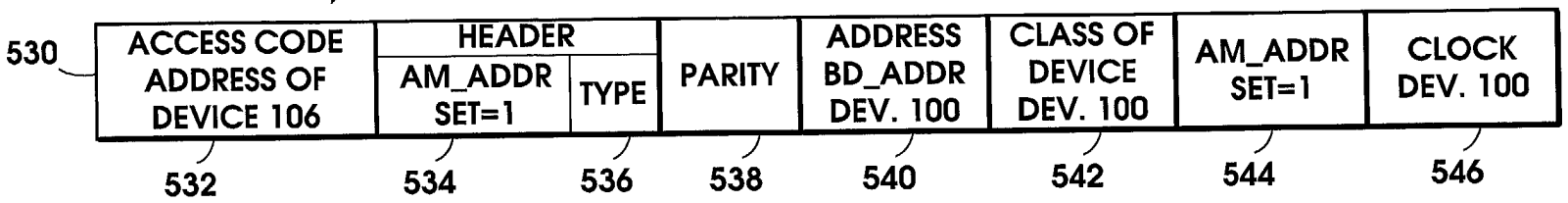


FIG. 4D

BLUETOOTH PACKET STRUCTURE
FOR A PAGE ACKNOWLEDGEMENT PACKET
SENT BY AD HOC NETWORK INFORMATION
PROVIDER 106

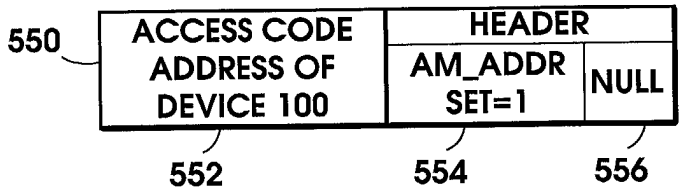


FIG. 4E

BLUETOOTH PACKET STRUCTURE FOR
SDP SERVICE SEARCH ATTRIBUTE REQUEST PACKET
SENT BY ARRIVING DEVICE 100
TO AD HOC NETWORK INFORMATION PROVIDER 106

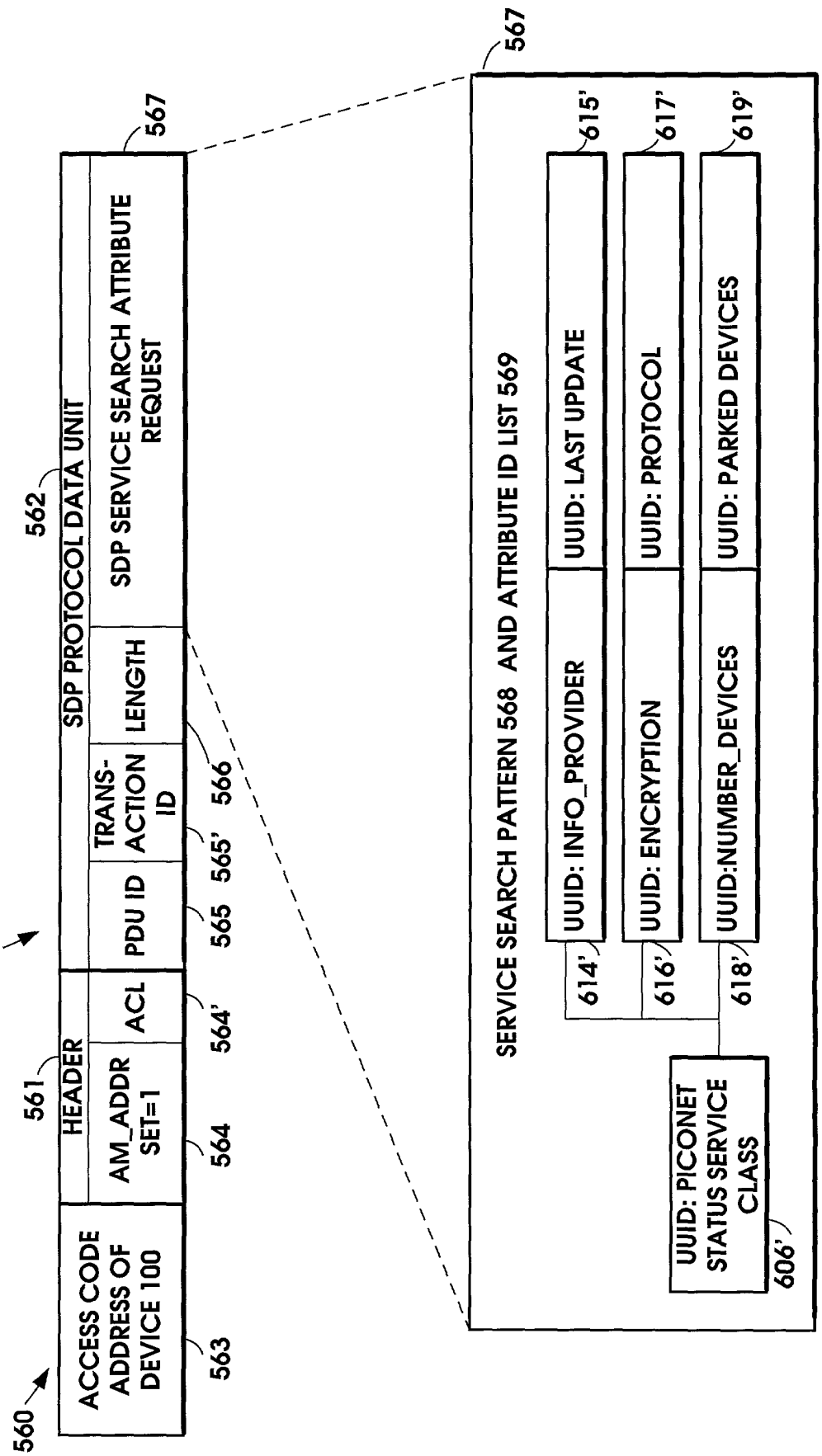


FIG. 4F

BLUETOOTH PACKET STRUCTURE FOR RESPONSE TO SDP SERVICE SEARCH ATTRIBUTE REQUEST, RESPONSE SENT BY AD HOC NETWORK INFORMATION PROVIDER 106 TO ARRIVING DEVICE 100

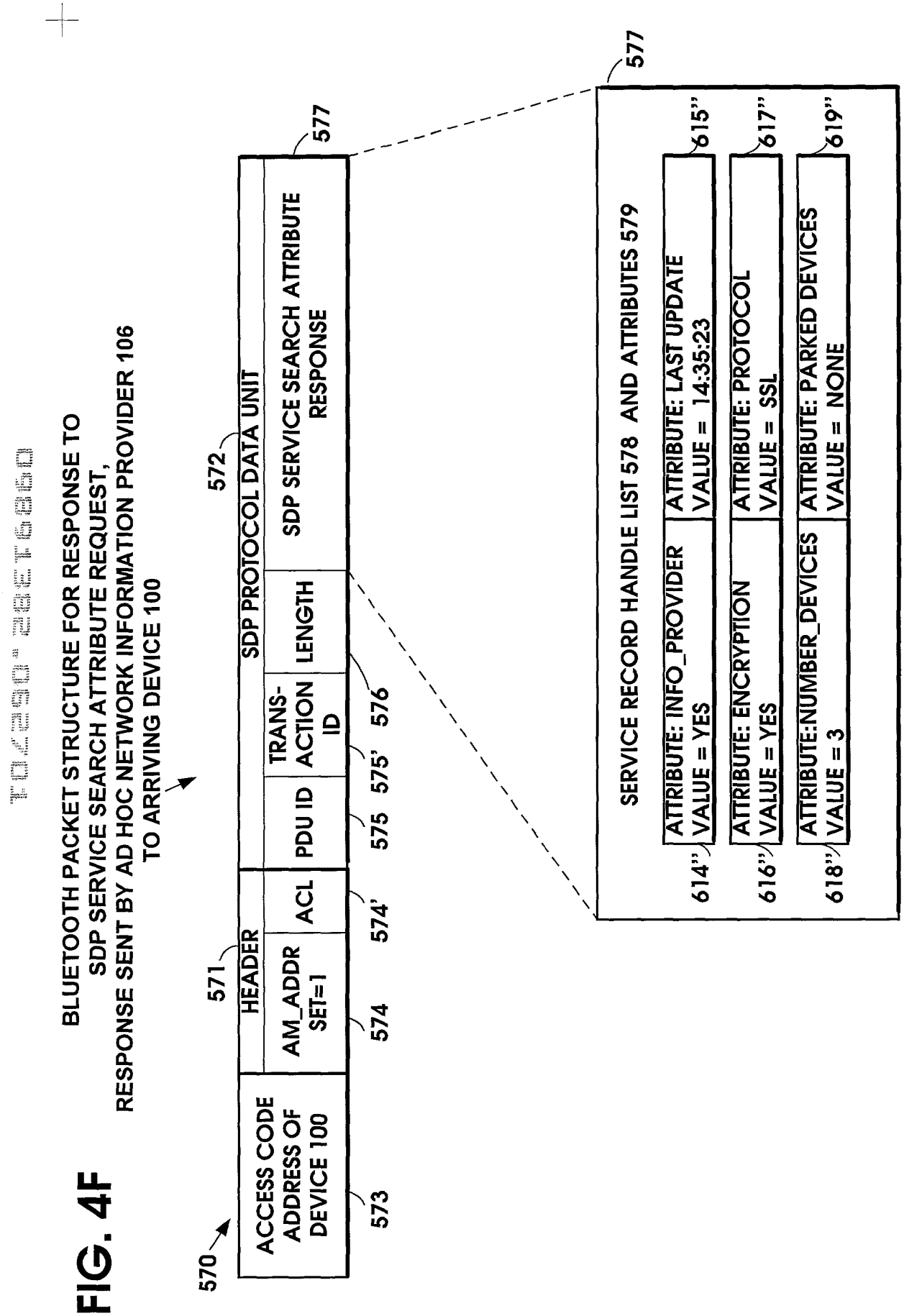


FIG. 4G BLUETOOTH PACKET STRUCTURE FOR SDP SERVICE SEARCH ATTRIBUTE REQUEST PACKET SENT BY ARRIVING DEVICE 100 TO AD HOC NETWORK INFORMATION PROVIDER 106

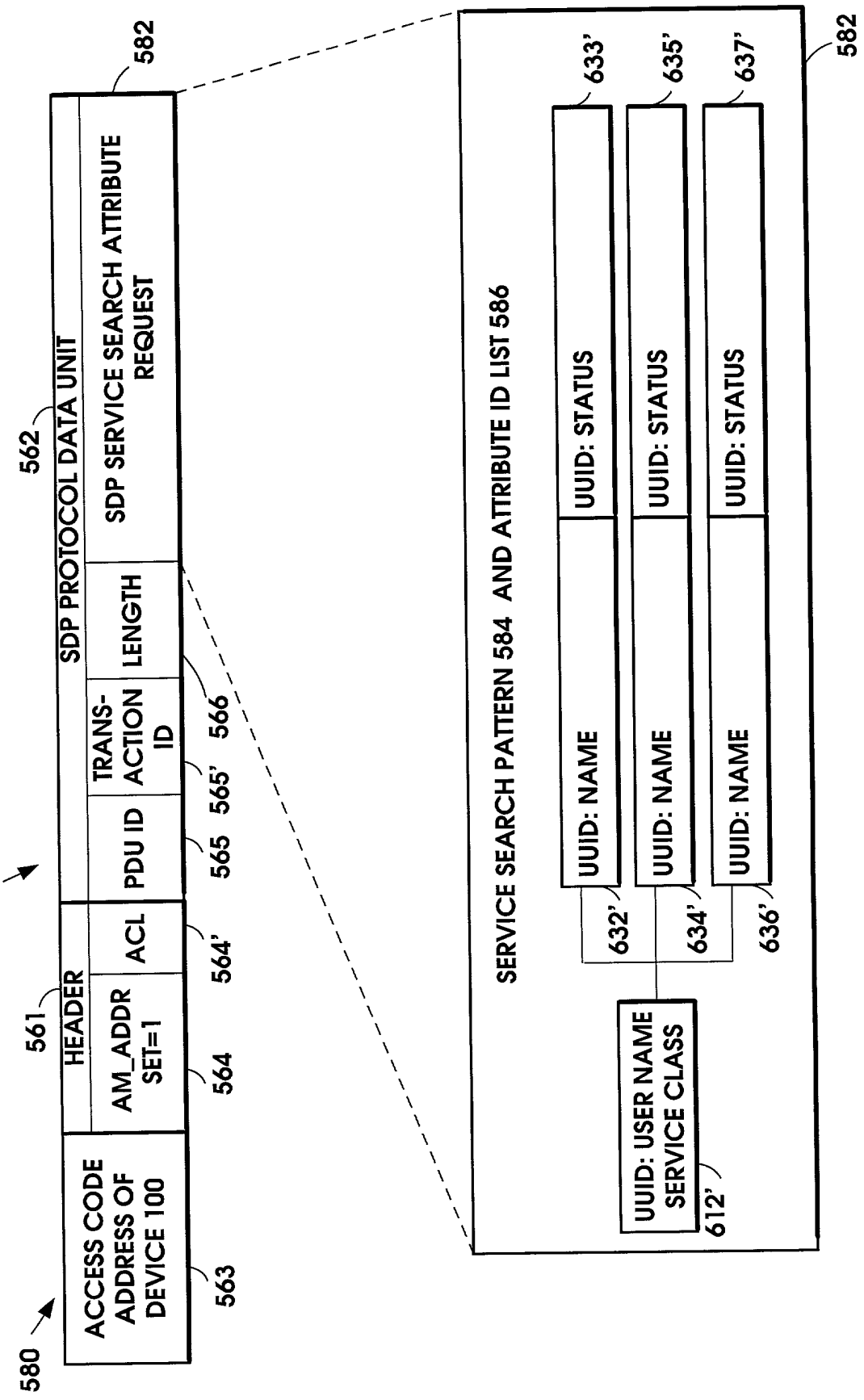


FIG. 4H

BLUETOOTH PACKET STRUCTURE FOR RESPONSE TO SDP SERVICE SEARCH ATTRIBUTE REQUEST, RESPONSE SENT BY AD HOC NETWORK INFORMATION PROVIDER 106 TO ARRIVING DEVICE 100

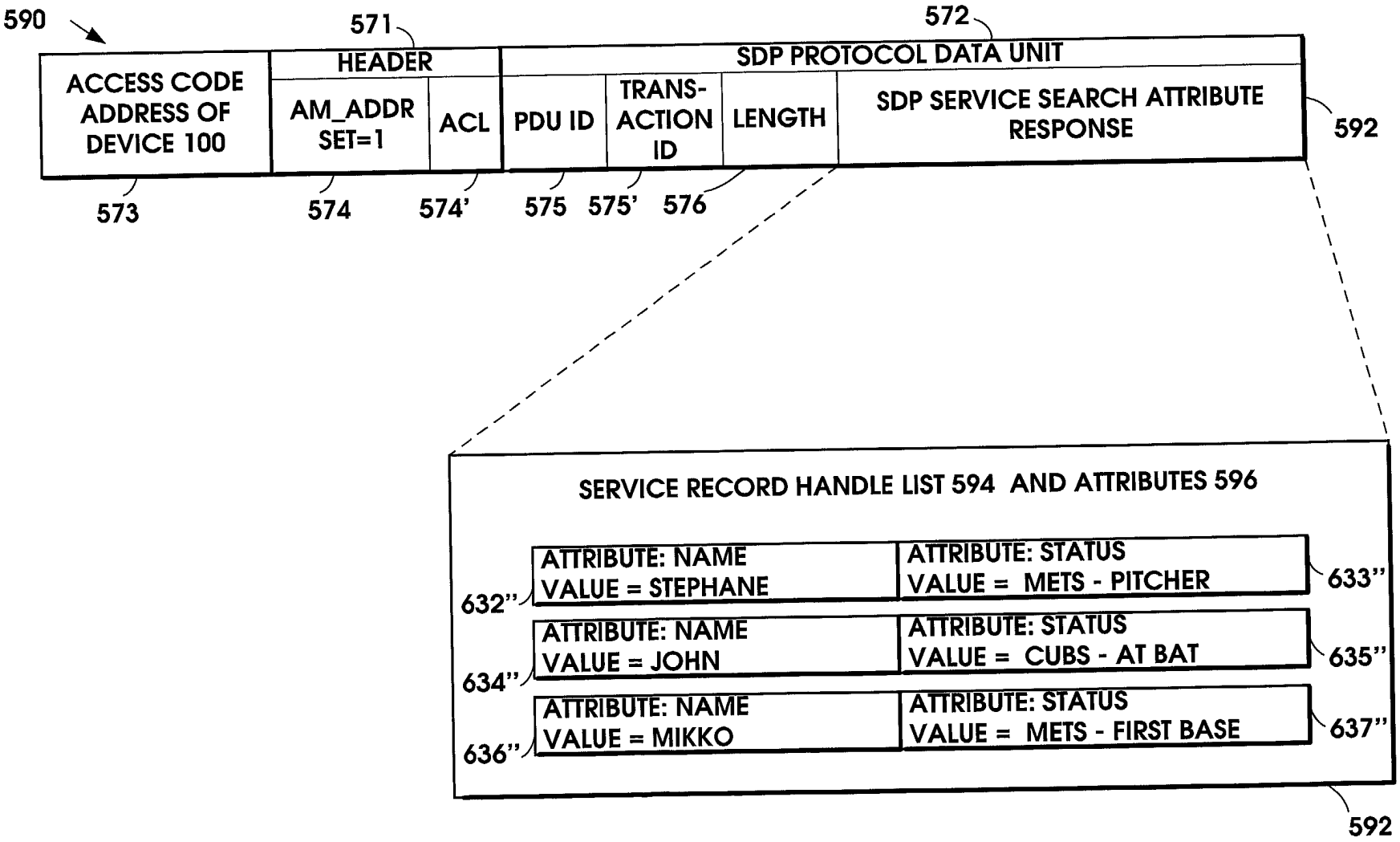


FIG. 4I

BLUETOOTH PACKET STRUCTURE FOR
SDP SERVICE SEARCH ATTRIBUTE REQUEST PACKET
SENT BY ARRIVING DEVICE 100
TO AD HOC NETWORK INFORMATION PROVIDER 116

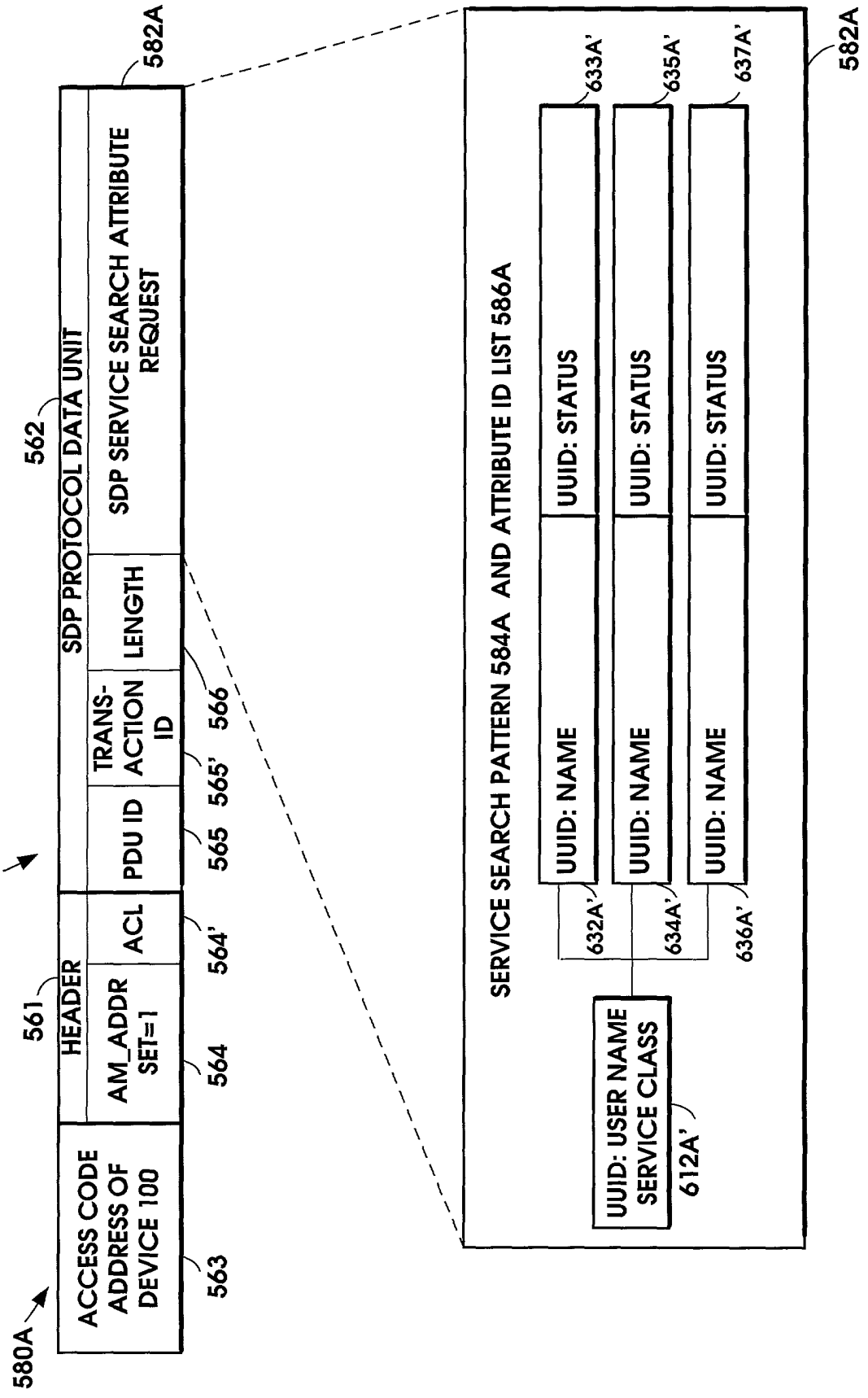
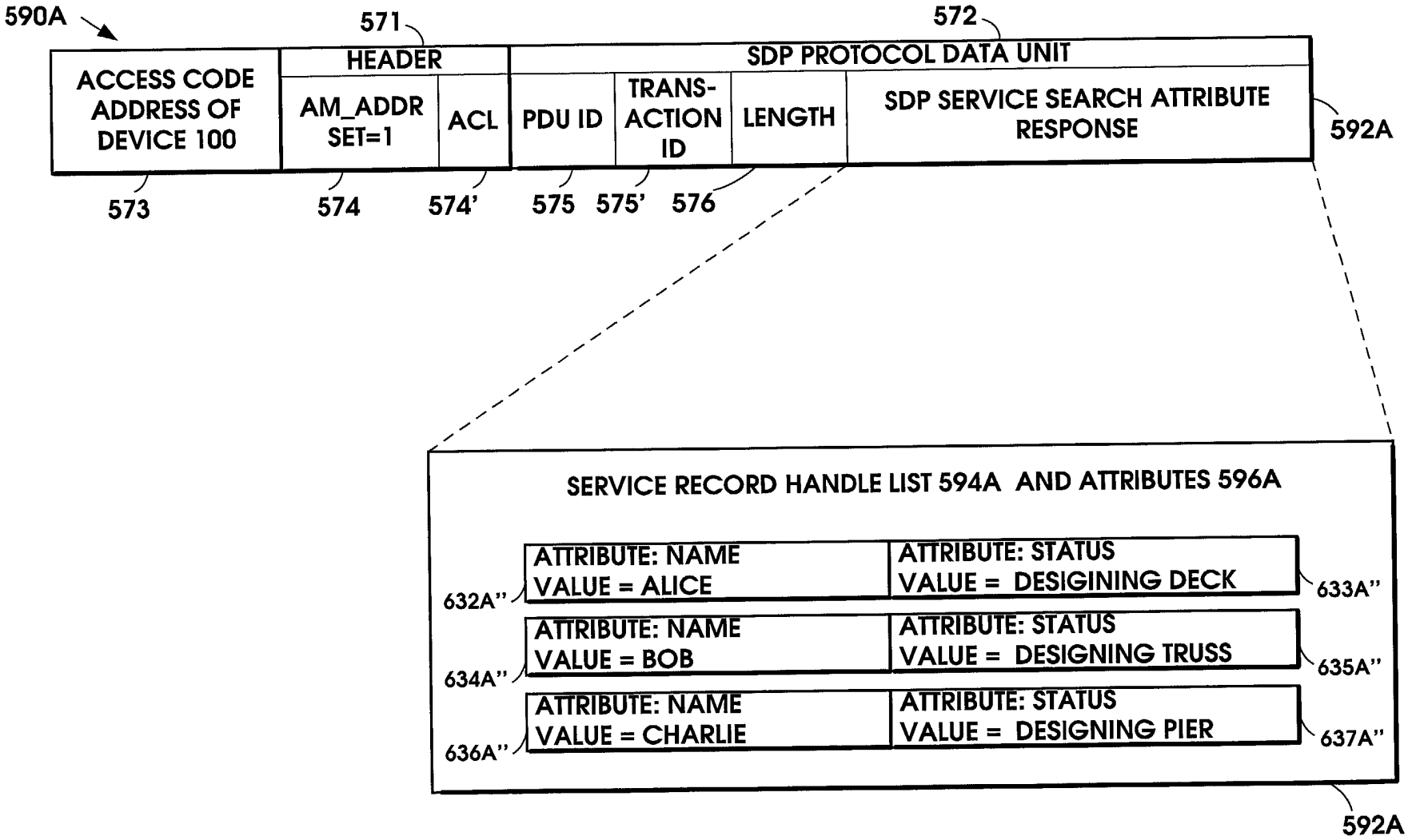


FIG. 4J

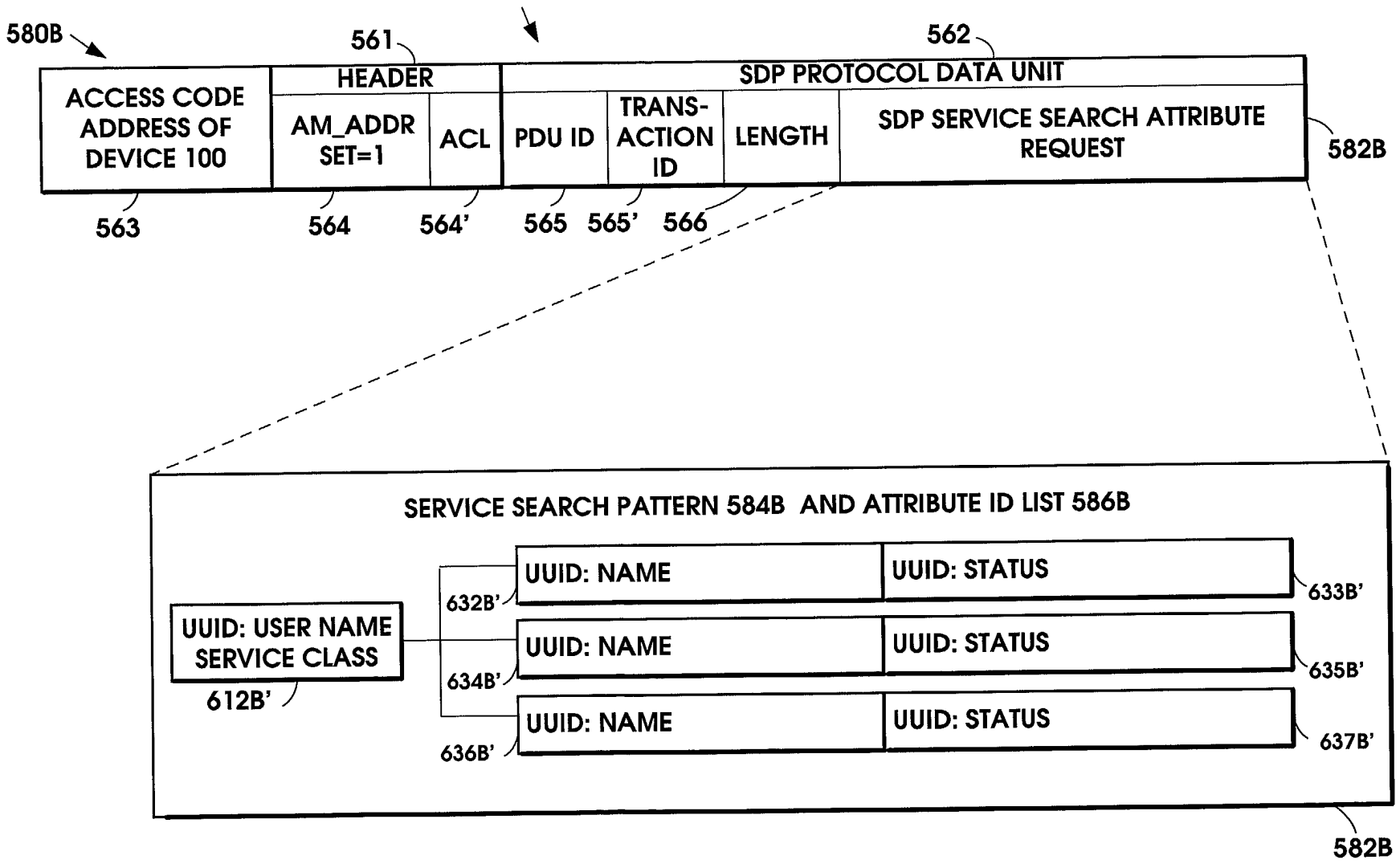
BLUETOOTH PACKET STRUCTURE FOR RESPONSE TO SDP SERVICE SEARCH ATTRIBUTE REQUEST, RESPONSE SENT BY AD HOC NETWORK INFORMATION PROVIDER 116 TO ARRIVING DEVICE 100



Mikko Oikkonen, Kai Nyman, Stephane Bouet
AD HOC NETWORKING DISCOVERY MENU
28377 (4208-4003)

FIG. 4K

BLUETOOTH PACKET STRUCTURE FOR
SDP SERVICE SEARCH ATTRIBUTE REQUEST PACKET
SENT BY ARRIVING DEVICE 100
TO AD HOC NETWORK INFORMATION PROVIDER 126



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AD HOC NETWORKING DISCOVERY MENU
28377 (4208-4003)

FIG. 4L

BLUETOOTH PACKET STRUCTURE FOR RESPONSE TO SDP SERVICE SEARCH ATTRIBUTE REQUEST, RESPONSE SENT BY AD HOC NETWORK INFORMATION PROVIDER 126 TO ARRIVING DEVICE 100

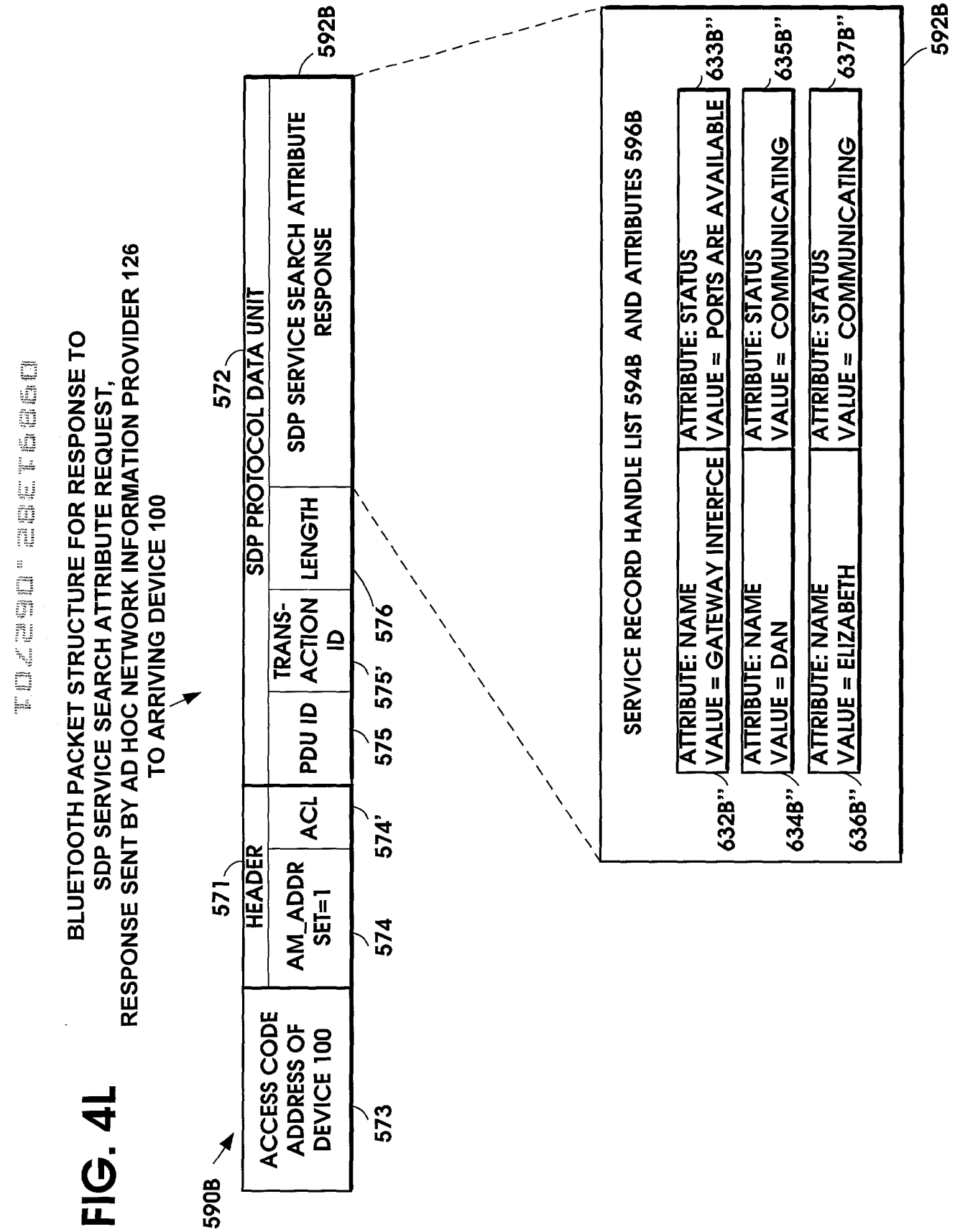


FIG. 5

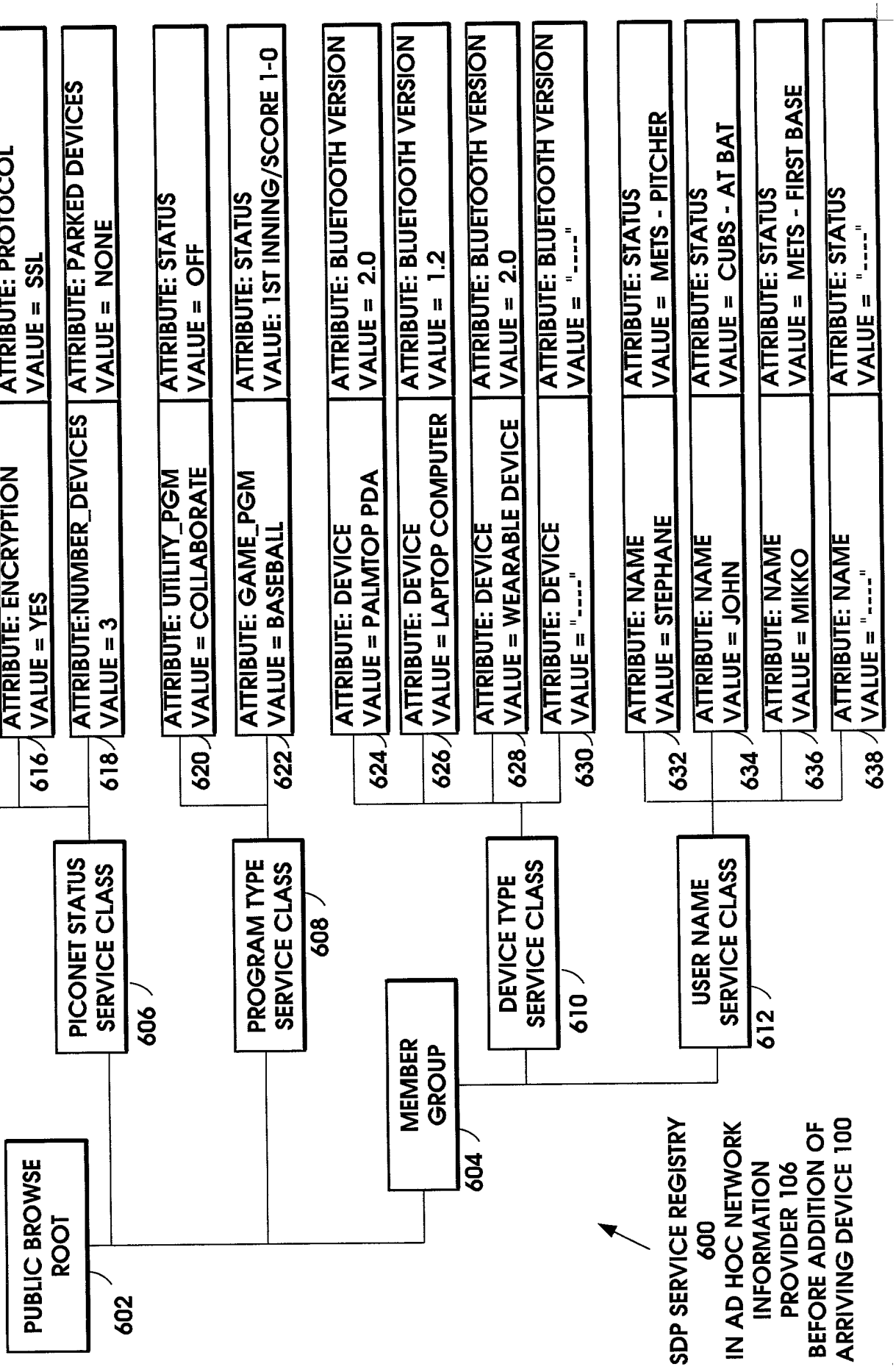


FIG. 5A

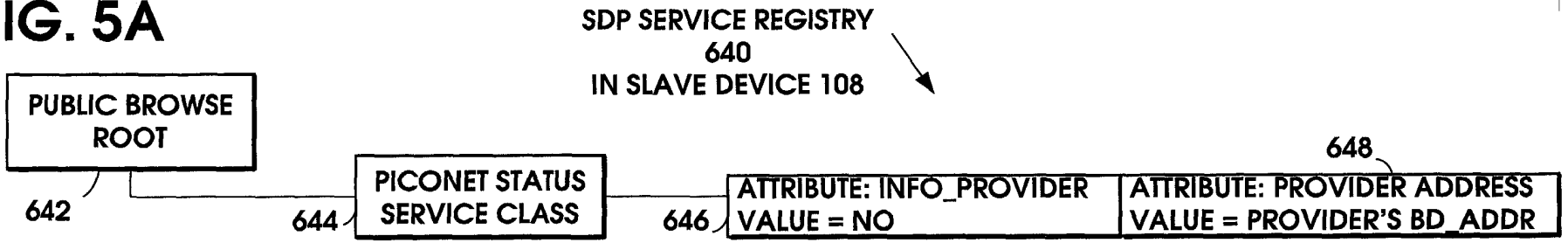


FIG. 5B

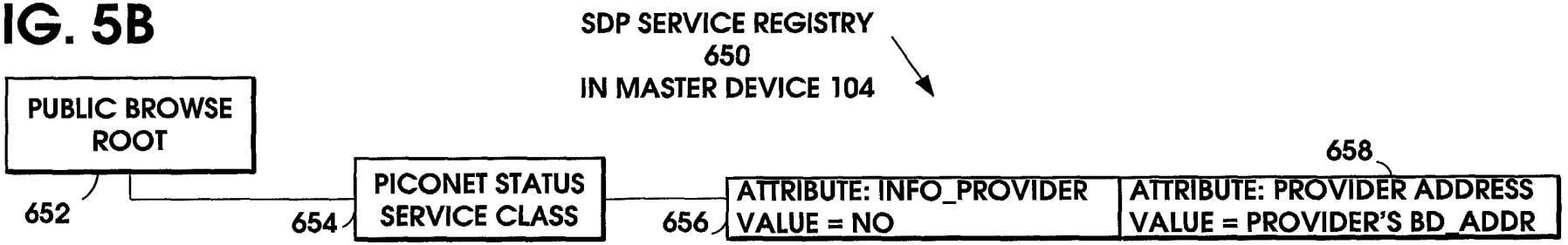
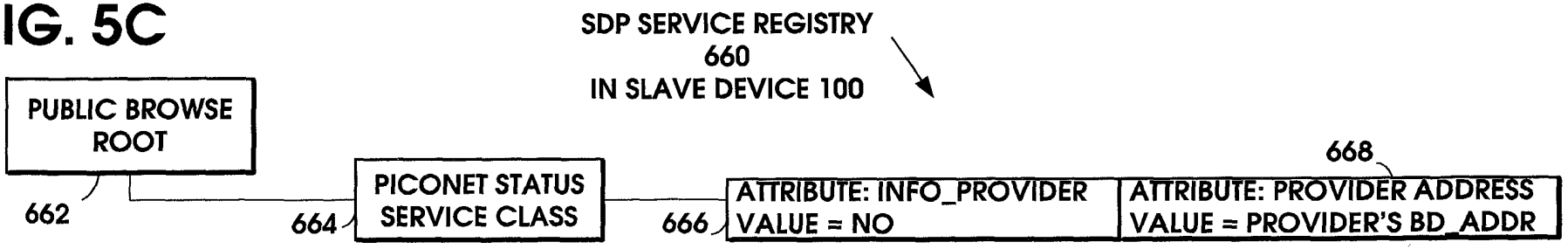


FIG. 5C



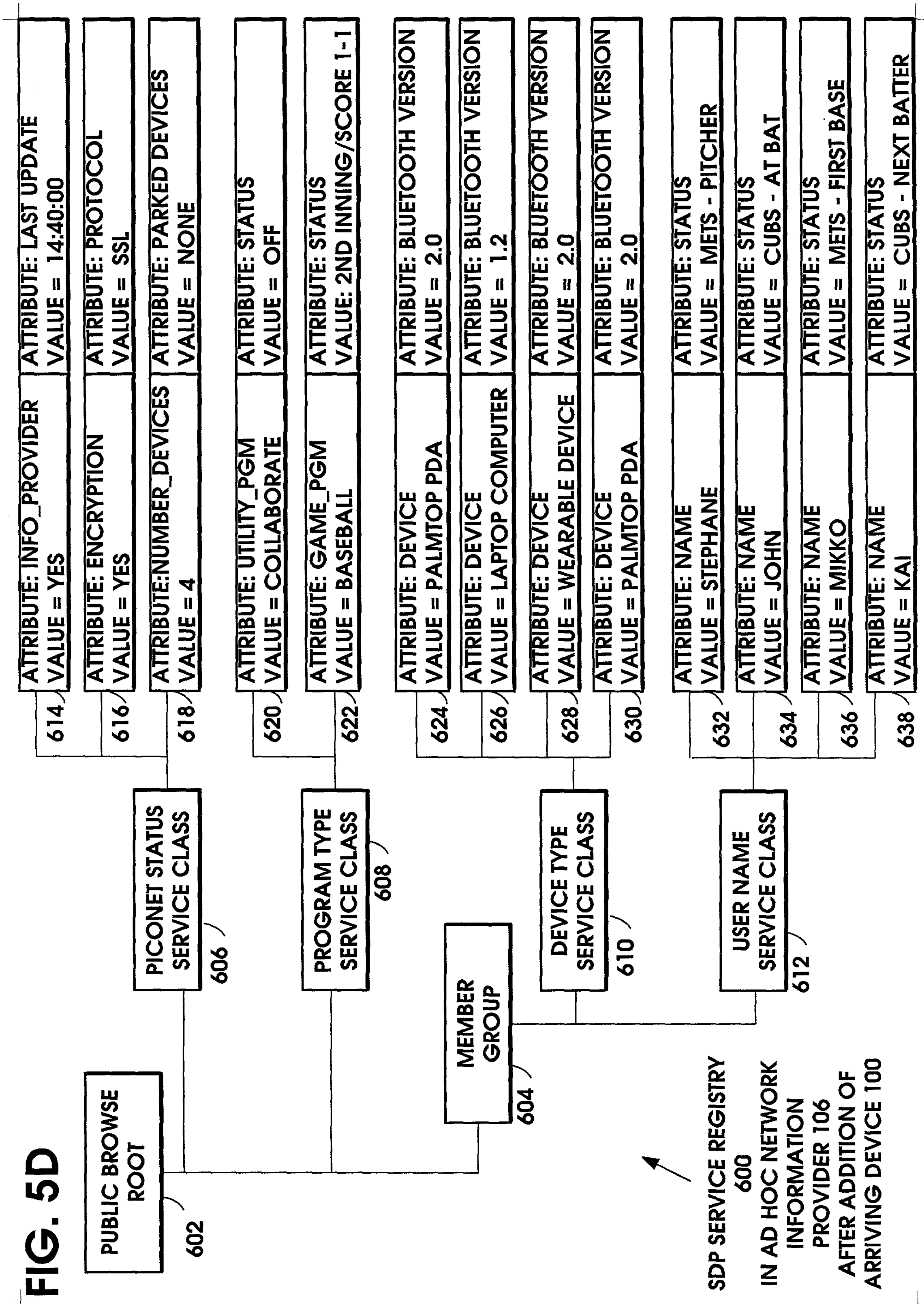
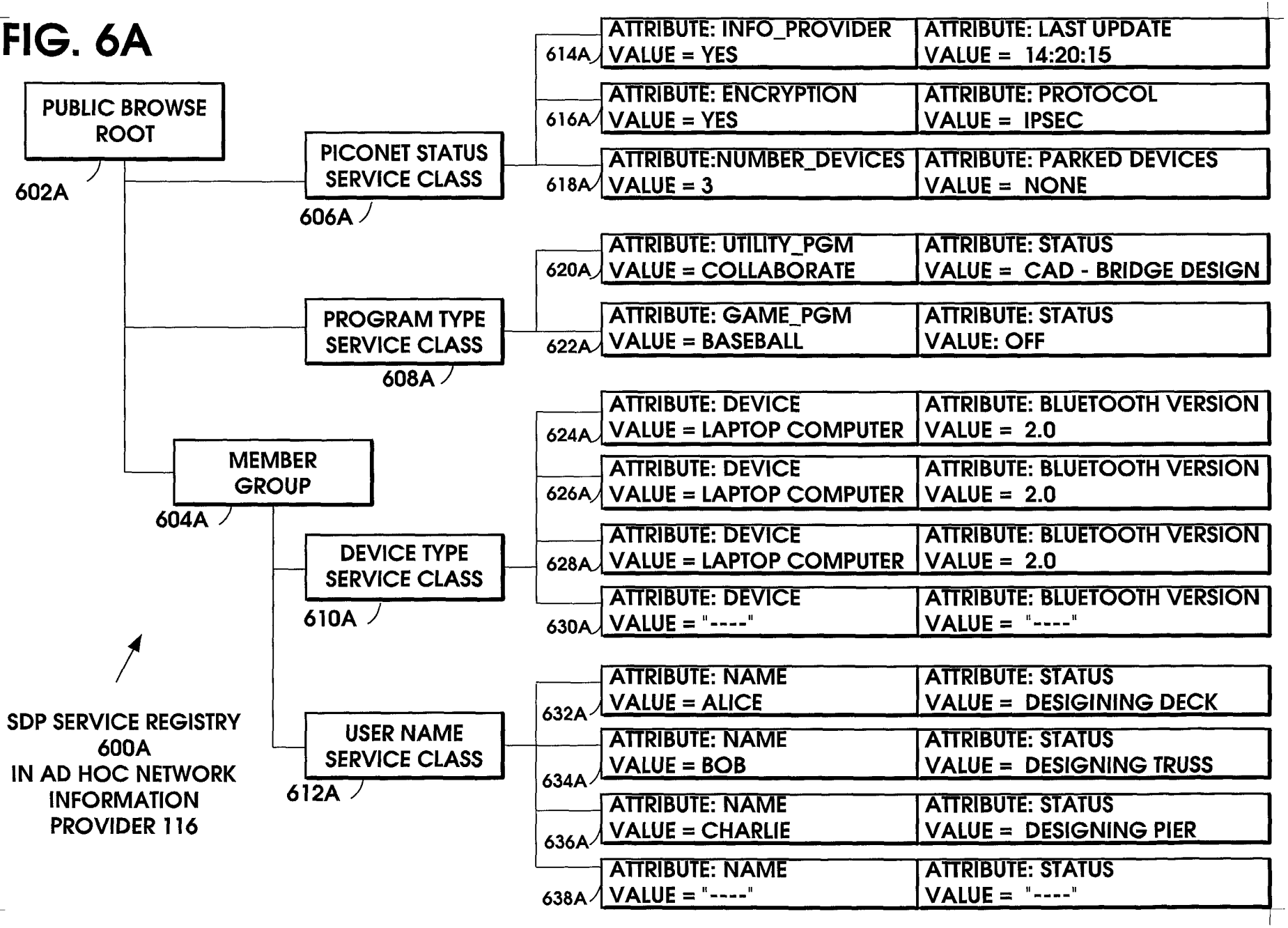

PUBLIC BROWSE ROOT
602
PICONET STATUS SERVICE CLASS
606
PROGRAM TYPE SERVICE CLASS
608
MEMBER GROUP
604
DEVICE TYPE SERVICE CLASS
610
USER NAME SERVICE CLASS
612
614
ATTRIBUTE: INFO_PROVIDER
VALUE = YES
ATTRIBUTE: LAST UPDATE
VALUE = 14:40:00
616
ATTRIBUTE: ENCRYPTION
VALUE = YES
ATTRIBUTE: PROTOCOL
VALUE = SSL
618
ATTRIBUTE:NUMBER_DEVICES
VALUE = 4
ATTRIBUTE: PARKED DEVICES
VALUE = NONE
620
ATTRIBUTE: UTILITY_PGM
VALUE = COLLABORATE
ATTRIBUTE: STATUS
VALUE = OFF
622
ATTRIBUTE: GAME_PGM
VALUE = BASEBALL
ATTRIBUTE: STATUS
VALUE: 2ND INNING/SCORE 1-1
624
ATTRIBUTE: DEVICE
VALUE = PALMTOP PDA
ATTRIBUTE: BLUETOOTH VERSION
VALUE = 2.0
626
ATTRIBUTE: DEVICE
VALUE = LAPTOP COMPUTER
ATTRIBUTE: BLUETOOTH VERSION
VALUE = 1.2
628
ATTRIBUTE: DEVICE
VALUE = WEARABLE DEVICE
ATTRIBUTE: BLUETOOTH VERSION
VALUE = 2.0
630
ATTRIBUTE: DEVICE
VALUE = PALMTOP PDA
ATTRIBUTE: BLUETOOTH VERSION
VALUE = 2.0
632
ATTRIBUTE: NAME
VALUE = STEPHANE
ATTRIBUTE: STATUS
VALUE = METS - PITCHER
634
ATTRIBUTE: NAME
VALUE = JOHN
ATTRIBUTE: STATUS
VALUE = CUBS - AT BAT
636
ATTRIBUTE: NAME
VALUE = MIKKO
ATTRIBUTE: STATUS
VALUE = METS - FIRST BASE
638
ATTRIBUTE: NAME
VALUE = KAI
ATTRIBUTE: STATUS
VALUE = CUBS - NEXT BATTER
SDP SERVICE REGISTRY
600
IN AD HOC NETWORK
INFORMATION
PROVIDER 106
AFTER ADDITION OF
ARRIVING DEVICE 100

FIG. 5D

FIG. 6A


PUBLIC BROWSE ROOT
602A
PICONET STATUS SERVICE CLASS
606A
PROGRAM TYPE SERVICE CLASS
608A
MEMBER GROUP
604A
DEVICE TYPE SERVICE CLASS
610A
USER NAME SERVICE CLASS
612A
SDP SERVICE REGISTRY 600A IN AD HOC NETWORK INFORMATION PROVIDER 116
614A
ATTRIBUTE: INFO_PROVIDER VALUE = YES
ATTRIBUTE: LAST UPDATE VALUE = 14:20:15
616A
ATTRIBUTE: ENCRYPTION VALUE = YES
ATTRIBUTE: PROTOCOL VALUE = IPSEC
618A
ATTRIBUTE:NUMBER_DEVICES VALUE = 3
ATTRIBUTE: PARKED DEVICES VALUE = NONE
620A
ATTRIBUTE: UTILITY_PGM VALUE = COLLABORATE
ATTRIBUTE: STATUS VALUE = CAD - BRIDGE DESIGN
622A
ATTRIBUTE: GAME_PGM VALUE = BASEBALL
ATTRIBUTE: STATUS VALUE: OFF
624A
ATTRIBUTE: DEVICE VALUE = LAPTOP COMPUTER
ATTRIBUTE: BLUETOOTH VERSION VALUE = 2.0
626A
ATTRIBUTE: DEVICE VALUE = LAPTOP COMPUTER
ATTRIBUTE: BLUETOOTH VERSION VALUE = 2.0
628A
ATTRIBUTE: DEVICE VALUE = LAPTOP COMPUTER
ATTRIBUTE: BLUETOOTH VERSION VALUE = 2.0
630A
ATTRIBUTE: DEVICE VALUE = "----"
ATTRIBUTE: BLUETOOTH VERSION VALUE = "----"
632A
ATTRIBUTE: NAME VALUE = ALICE
ATTRIBUTE: STATUS VALUE = DESIGINING DECK
634A
ATTRIBUTE: NAME VALUE = BOB
ATTRIBUTE: STATUS VALUE = DESIGNING TRUSS
636A
ATTRIBUTE: NAME VALUE = CHARLIE
ATTRIBUTE: STATUS VALUE = DESIGNING PIER
638A
ATTRIBUTE: NAME VALUE = "----"
ATTRIBUTE: STATUS VALUE = "----"

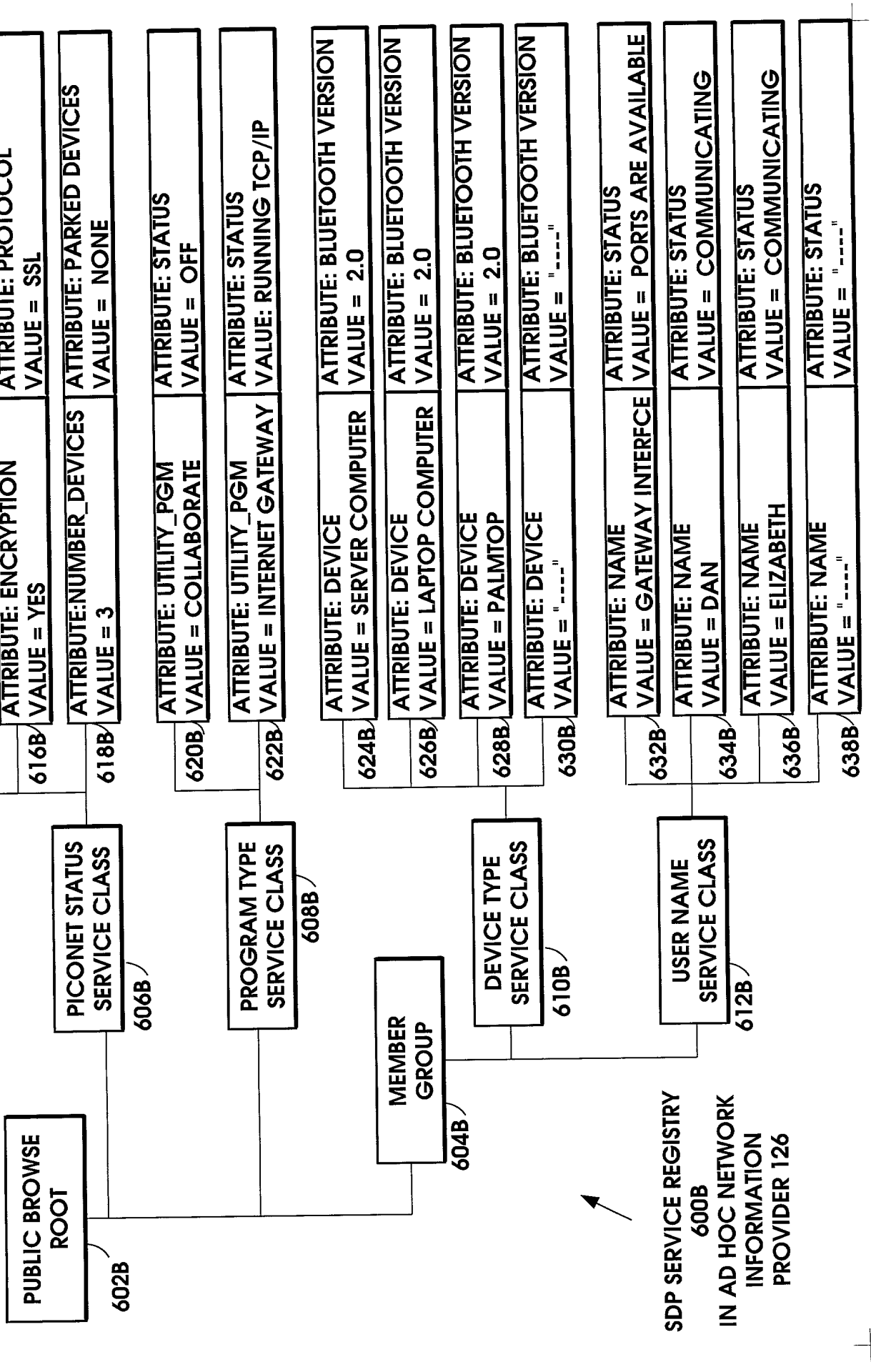

PUBLIC BROWSE ROOT
602B
PICONET STATUS SERVICE CLASS
606B
PROGRAM TYPE SERVICE CLASS
608B
MEMBER GROUP
604B
DEVICE TYPE SERVICE CLASS
610B
USER NAME SERVICE CLASS
612B
ATTRIBUTE: INFO_PROVIDER VALUE = YES
614B
ATTRIBUTE: LAST UPDATE VALUE = 14:30:10
ATTRIBUTE: ENCRYPTION VALUE = YES
616B
ATTRIBUTE: PROTOCOL VALUE = SSL
ATTRIBUTE:NUMBER_DEVICES VALUE = 3
618B
ATTRIBUTE: PARKED DEVICES VALUE = NONE
ATTRIBUTE: UTILITY_PGM VALUE = COLLABORATE
620B
ATTRIBUTE: STATUS VALUE = OFF
ATTRIBUTE: UTILITY_PGM VALUE = INTERNET GATEWAY
622B
ATTRIBUTE: STATUS VALUE: RUNNING TCP/IP
ATTRIBUTE: DEVICE VALUE = SERVER COMPUTER
624B
ATTRIBUTE: BLUETOOTH VERSION VALUE = 2.0
ATTRIBUTE: DEVICE VALUE = LAPTOP COMPUTER
626B
ATTRIBUTE: BLUETOOTH VERSION VALUE = 2.0
ATTRIBUTE: DEVICE VALUE = PALMTOP
628B
ATTRIBUTE: BLUETOOTH VERSION VALUE = 2.0
ATTRIBUTE: DEVICE VALUE = "----"
630B
ATTRIBUTE: BLUETOOTH VERSION VALUE = "----"
ATTRIBUTE: NAME VALUE = GATEWAY INTERFCE
632B
ATTRIBUTE: STATUS VALUE = PORTS ARE AVAILABLE
ATTRIBUTE: NAME VALUE = DAN
634B
ATTRIBUTE: STATUS VALUE = COMMUNICATING
ATTRIBUTE: NAME VALUE = ELIZABETH
636B
ATTRIBUTE: STATUS VALUE = COMMUNICATING
ATTRIBUTE: NAME VALUE = "----"
638B
ATTRIBUTE: STATUS VALUE = "----"
SDP SERVICE REGISTRY 600B IN AD HOC NETWORK INFORMATION PROVIDER 126

FIG. 6B

FIG. 7

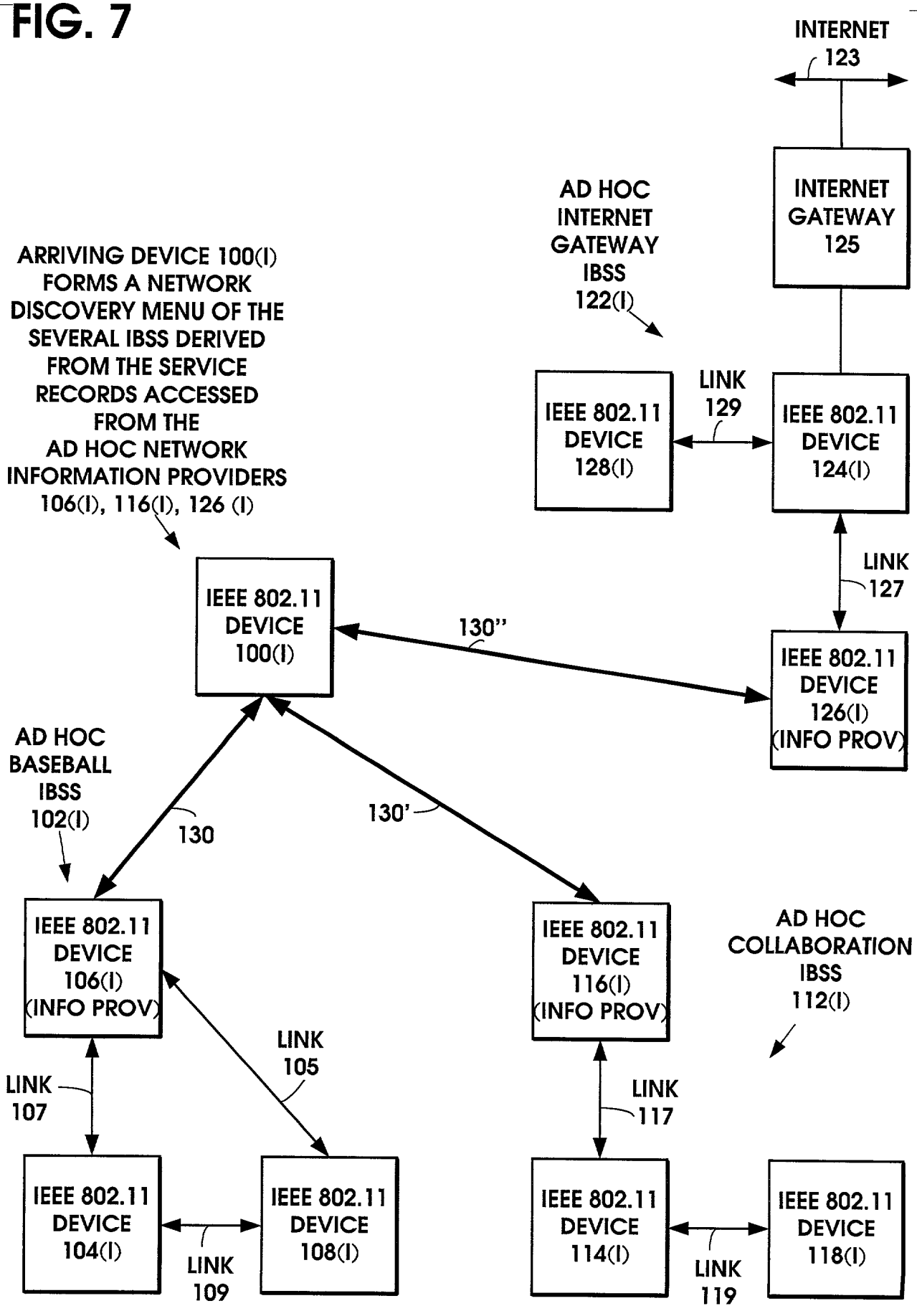
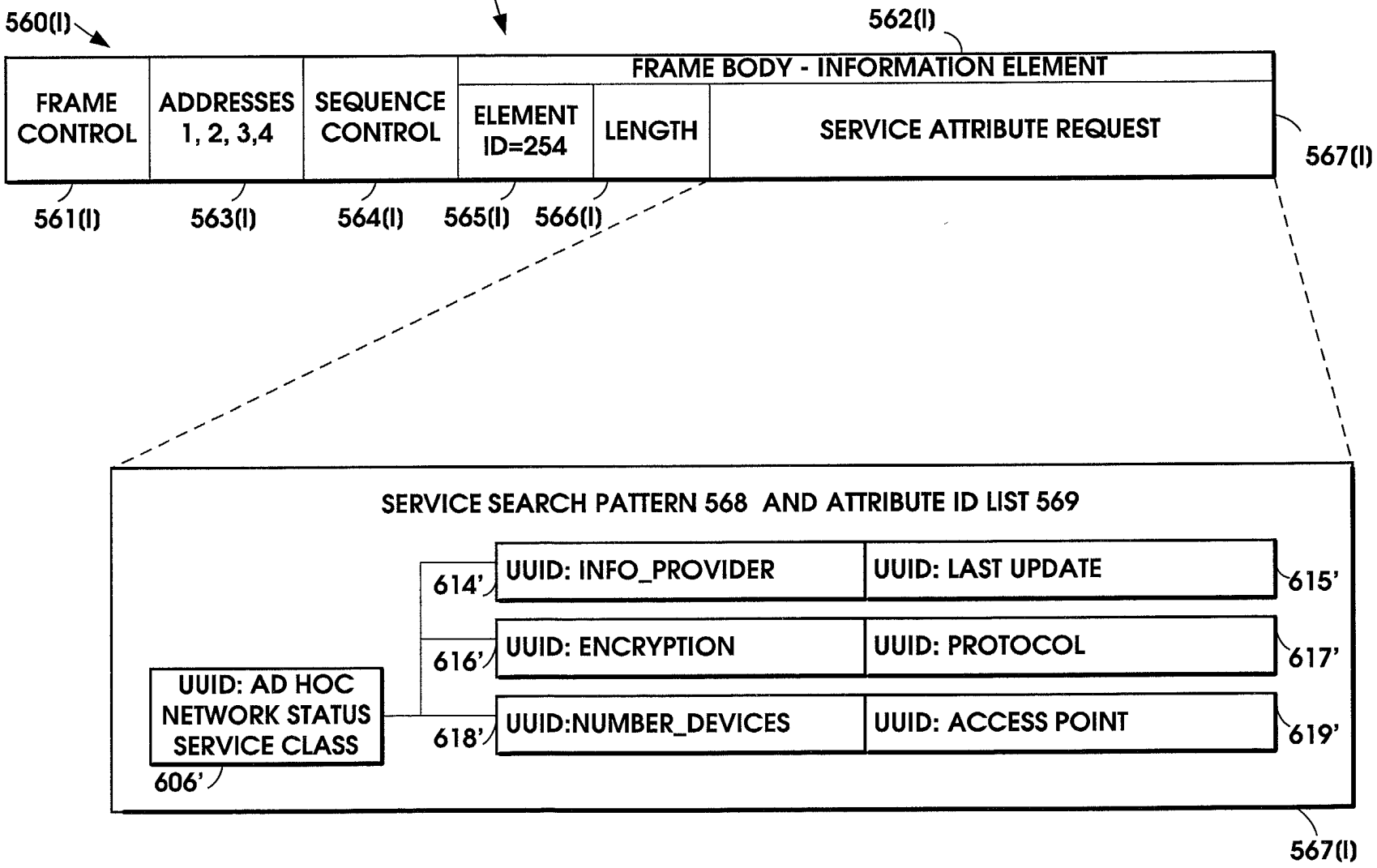

INTERNET
123
INTERNET GATEWAY 125
AD HOC INTERNET GATEWAY IBSS 122(I)
ARRIVING DEVICE 100(I) FORMS A NETWORK DISCOVERY MENU OF THE SEVERAL IBSS DERIVED FROM THE SERVICE RECORDS ACCESSED FROM THE AD HOC NETWORK INFORMATION PROVIDERS 106(I), 116(I), 126 (I)
IEEE 802.11 DEVICE 128(I)
LINK 129
IEEE 802.11 DEVICE 124(I)
LINK 127
IEEE 802.11 DEVICE 100(I)
130''
IEEE 802.11 DEVICE 126(I) (INFO PROV)
AD HOC BASEBALL IBSS 102(I)
130
130'
IEEE 802.11 DEVICE 106(I) (INFO PROV)
IEEE 802.11 DEVICE 116(I) (INFO PROV)
AD HOC COLLABORATION IBSS 112(I)
LINK 105
LINK 107
LINK 117
IEEE 802.11 DEVICE 104(I)
IEEE 802.11 DEVICE 108(I)
IEEE 802.11 DEVICE 114(I)
IEEE 802.11 DEVICE 118(I)
LINK 109
LINK 119

FIG. 7A

IEEE 802.11 PACKET STRUCTURE FOR PROBE REQUEST,
SENT BY ARRIVING DEVICE 100(I) TO
AD HOC NETWORK INFORMATION PROVIDER 106(I)



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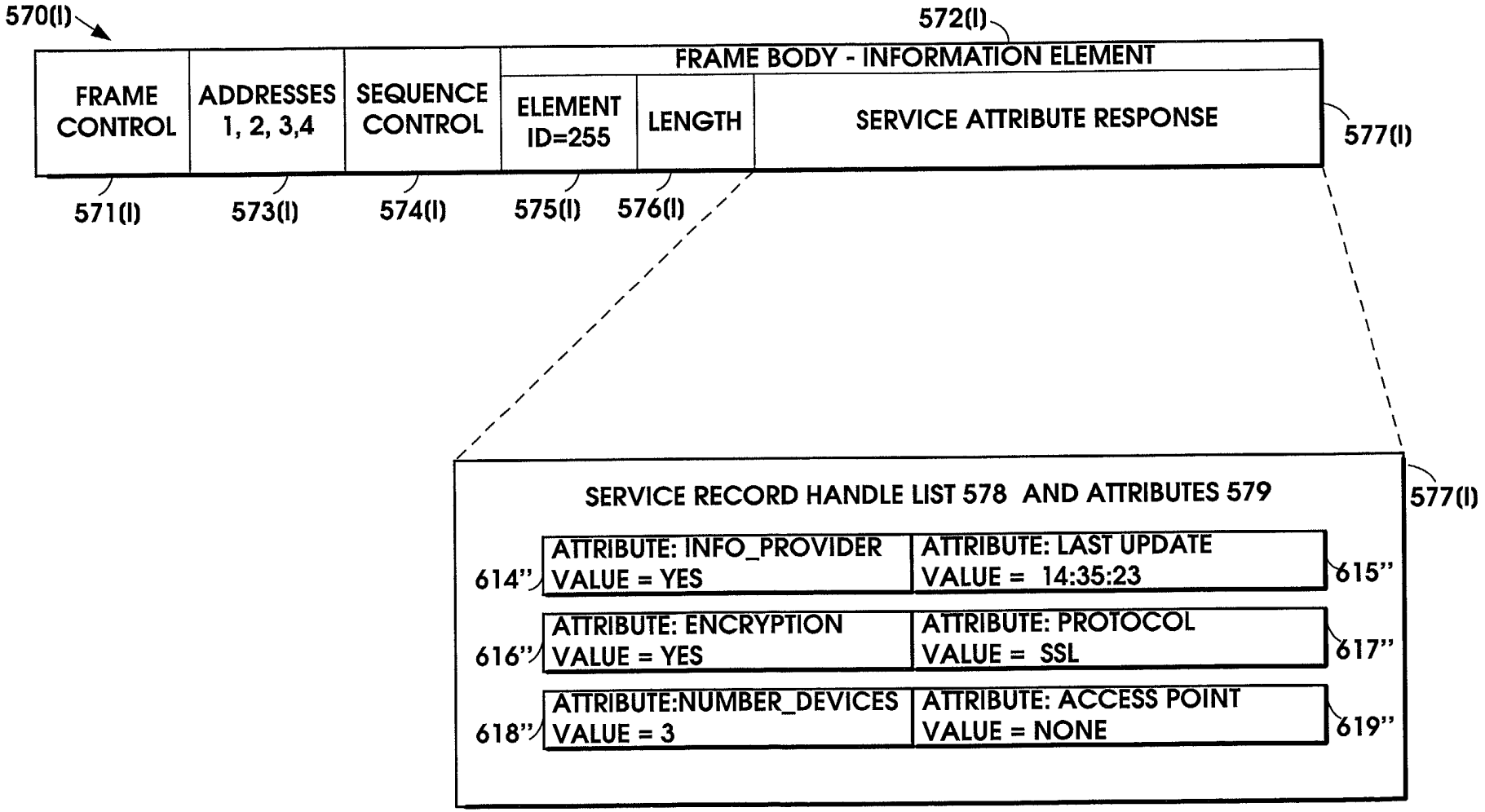
28377 (4208-4003)

FIG. 7B

IEEE 802.11 PACKET STRUCTURE FOR PROBE RESPONSE TO PROBE REQUEST, THIS RESPONSE SENT BY AD HOC NETWORK INFORMATION PROVIDER 106(I) TO ARRIVING DEVICE 100(I)



Mikko Oikkonen, Kai Nyman, Stephane Bouet
AD HOC NETWORKING DISCOVERY MENU
28377 (4208-4003)

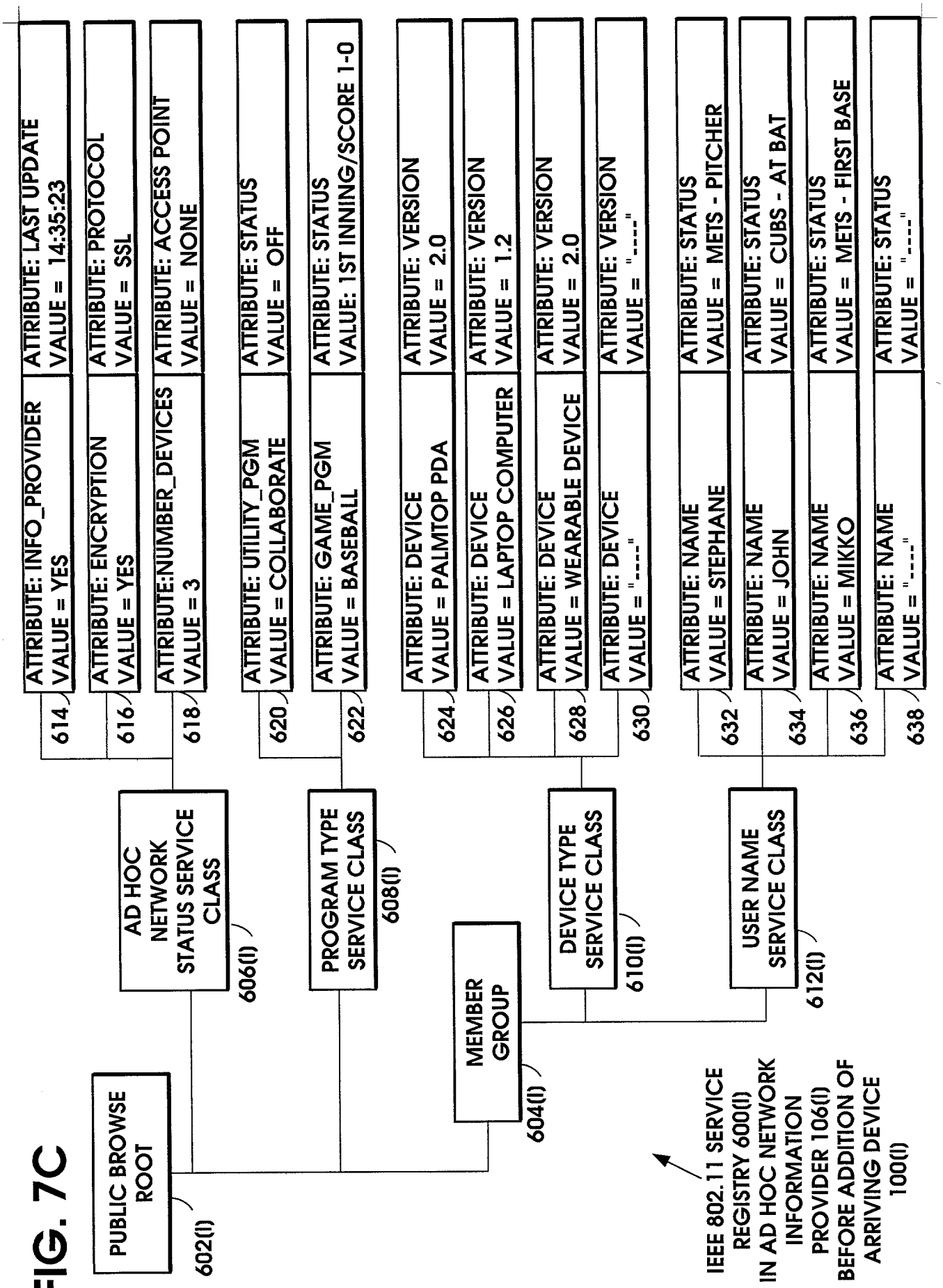

PUBLIC BROWSE ROOT
602(I)
AD HOC NETWORK STATUS SERVICE CLASS
606(I)
PROGRAM TYPE SERVICE CLASS
608(I)
MEMBER GROUP
604(I)
DEVICE TYPE SERVICE CLASS
610(I)
USER NAME SERVICE CLASS
612(I)
ATTRIBUTE: INFO_PROVIDER VALUE = YES
614
ATTRIBUTE: ENCRYPTION VALUE = YES
616
ATTRIBUTE:NUMBER_DEVICES VALUE = 3
618
ATTRIBUTE: UTILITY_PGM VALUE = COLLABORATE
620
ATTRIBUTE: GAME_PGM VALUE = BASEBALL
622
ATTRIBUTE: DEVICE VALUE = PALMTOP PDA
624
ATTRIBUTE: DEVICE VALUE = LAPTOP COMPUTER
626
ATTRIBUTE: DEVICE VALUE = WEARABLE DEVICE
628
ATTRIBUTE: DEVICE VALUE = "----"
630
ATTRIBUTE: NAME VALUE = STEPHANE
632
ATTRIBUTE: NAME VALUE = JOHN
634
ATTRIBUTE: NAME VALUE = MIKKO
636
ATTRIBUTE: NAME VALUE = "----"
638
ATTRIBUTE: LAST UPDATE VALUE = 14:35:23
ATTRIBUTE: PROTOCOL VALUE = SSL
ATTRIBUTE: ACCESS POINT VALUE = NONE
ATTRIBUTE: STATUS VALUE = OFF
ATTRIBUTE: STATUS VALUE: 1ST INNING/SCORE 1-0
ATTRIBUTE: VERSION VALUE = 2.0
ATTRIBUTE: VERSION VALUE = 1.2
ATTRIBUTE: VERSION VALUE = 2.0
ATTRIBUTE: VERSION VALUE = "----"
ATTRIBUTE: STATUS VALUE = METS - PITCHER
ATTRIBUTE: STATUS VALUE = CUBS - AT BAT
ATTRIBUTE: STATUS VALUE = METS - FIRST BASE
ATTRIBUTE: STATUS VALUE = "----"
IEEE 802.11 SERVICE REGISTRY 600(I) IN AD HOC NETWORK INFORMATION PROVIDER 106(I) BEFORE ADDITION OF ARRIVING DEVICE 100(I)

FIG. 7C

FIG. 8

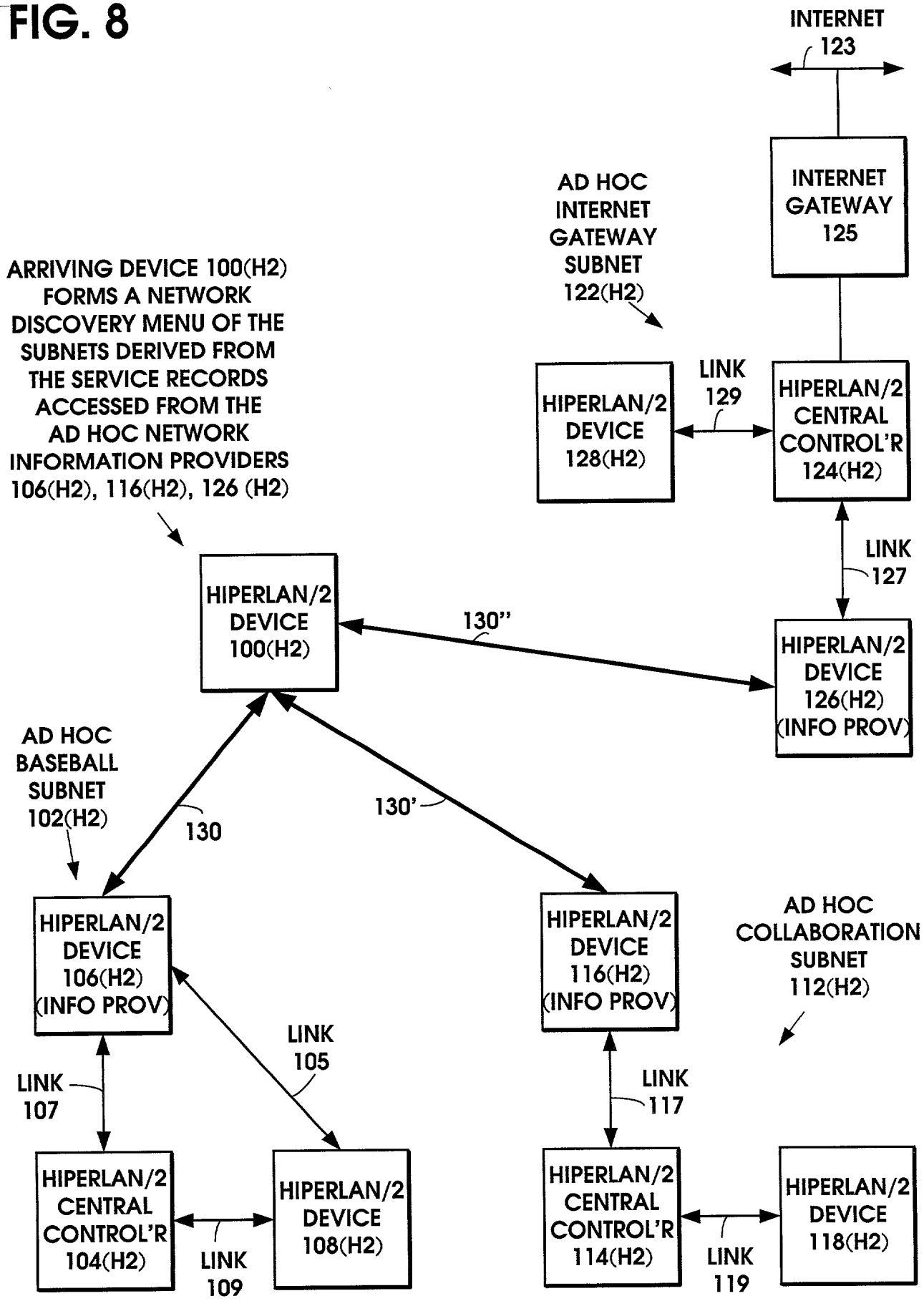
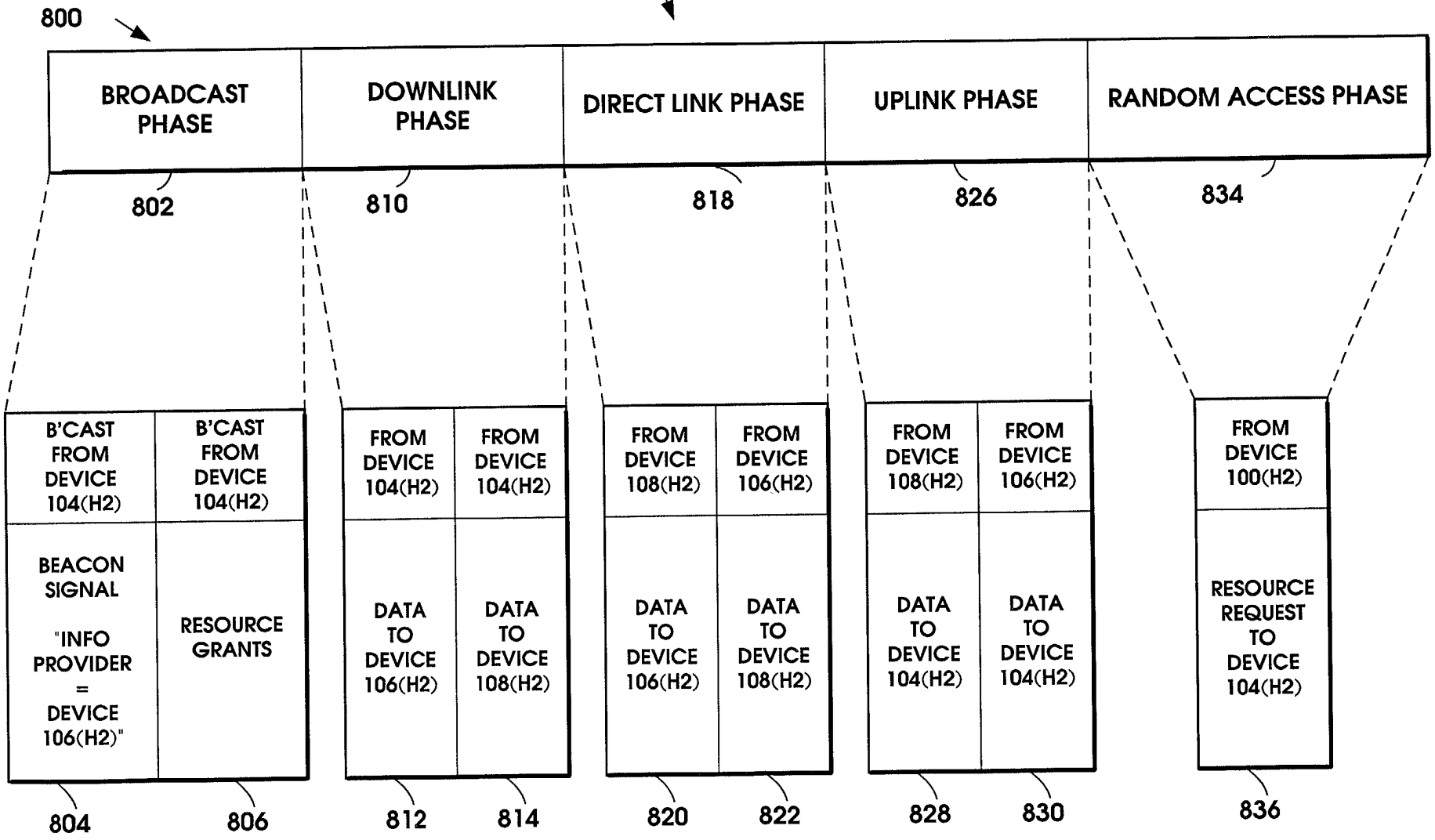

INTERNET
123
INTERNET GATEWAY 125
AD HOC INTERNET GATEWAY SUBNET 122(H2)
ARRIVING DEVICE 100(H2) FORMS A NETWORK DISCOVERY MENU OF THE SUBNETS DERIVED FROM THE SERVICE RECORDS ACCESSED FROM THE AD HOC NETWORK INFORMATION PROVIDERS 106(H2), 116(H2), 126 (H2)
HIPERLAN/2 DEVICE 128(H2)
LINK 129
HIPERLAN/2 CENTRAL CONTROL'R 124(H2)
LINK 127
HIPERLAN/2 DEVICE 100(H2)
130''
HIPERLAN/2 DEVICE 126(H2) (INFO PROV)
AD HOC BASEBALL SUBNET 102(H2)
130
130'
HIPERLAN/2 DEVICE 106(H2) (INFO PROV)
HIPERLAN/2 DEVICE 116(H2) (INFO PROV)
AD HOC COLLABORATION SUBNET 112(H2)
LINK 105
LINK 107
LINK 117
HIPERLAN/2 CENTRAL CONTROL'R 104(H2)
LINK 109
HIPERLAN/2 DEVICE 108(H2)
HIPERLAN/2 CENTRAL CONTROL'R 114(H2)
LINK 119
HIPERLAN/2 DEVICE 118(H2)

FIG. 8A

HIPERLAN TYPE 2 MAC FRAME STRUCTURE 800
INCLUDING RANDOM CHANNEL RESOURCE REQUEST 836,
SENT BY ARRIVING DEVICE 100(H2) TO
CENTRAL CONTROLLER DEVICE 104(H2)



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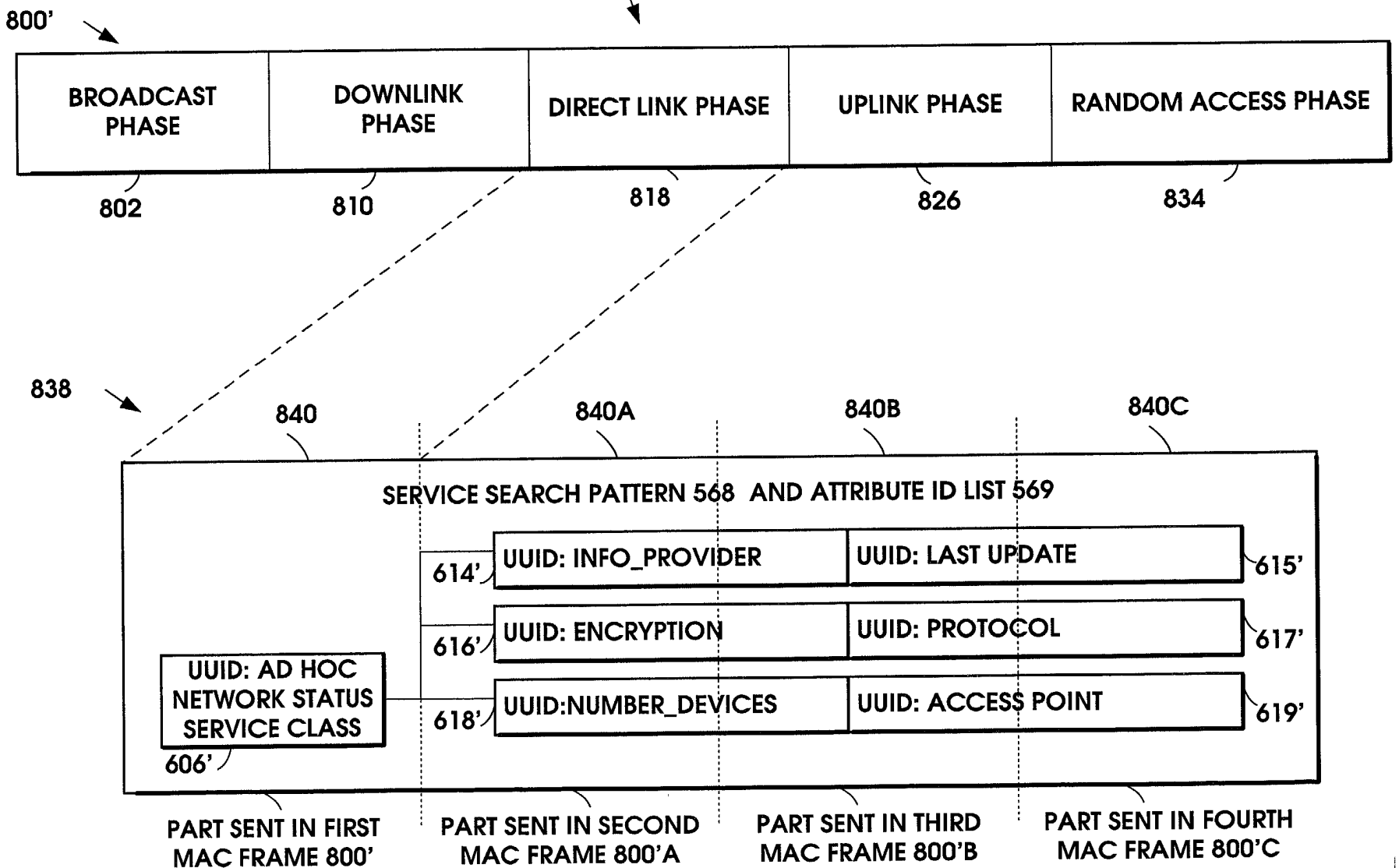
28377 (4208-4003)

FIG. 8B

HIPERLAN TYPE 2 MAC FRAME STRUCTURE 800'
INCLUDING SERVICE RECORD REQUEST 838,
SENT BY ARRIVING DEVICE 100(H2) TO
AD HOC NETWORK INFORMATION PROVIDER 106(H2)



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28377 (4208-4003)

FIG. 8C

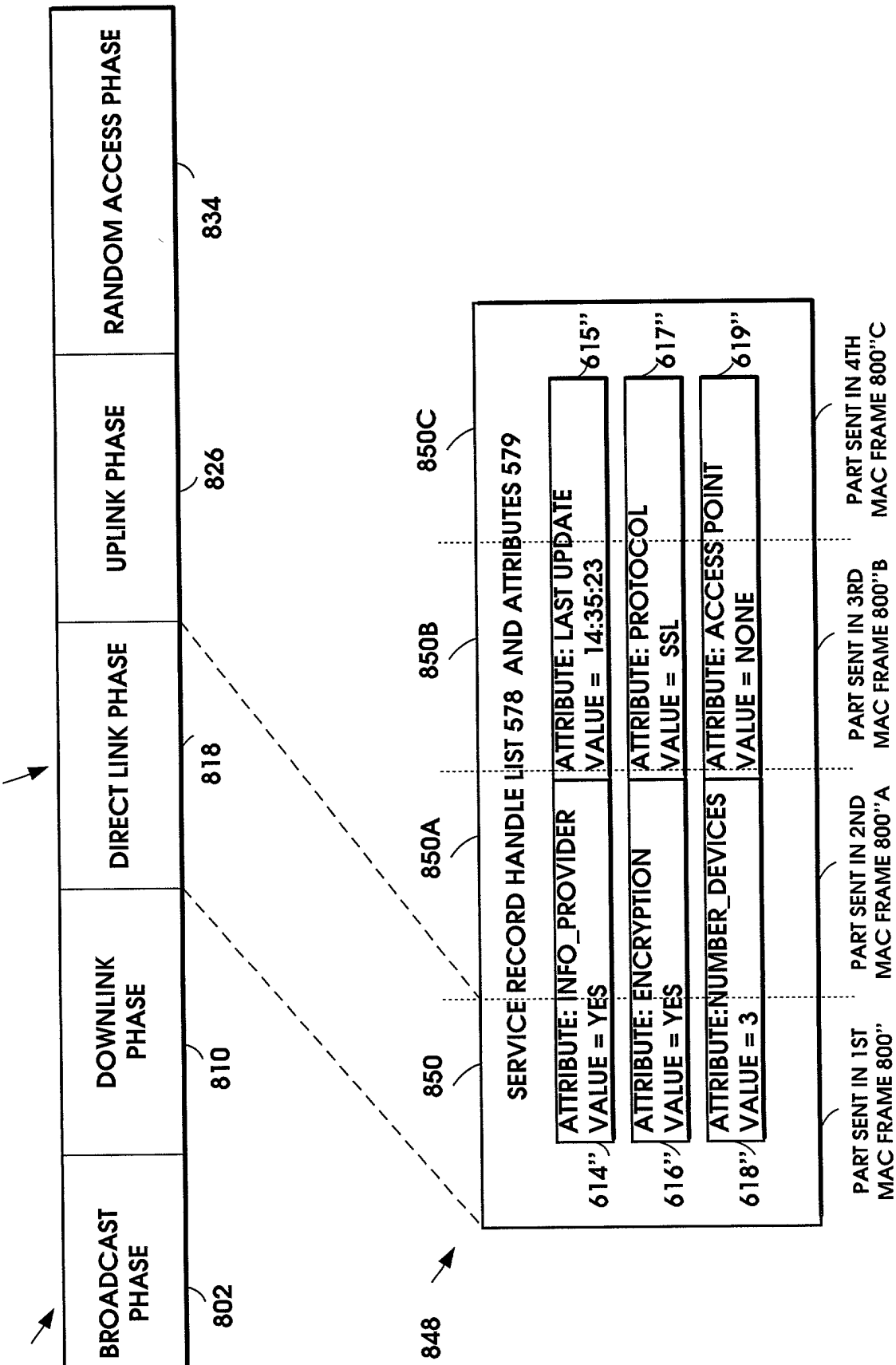
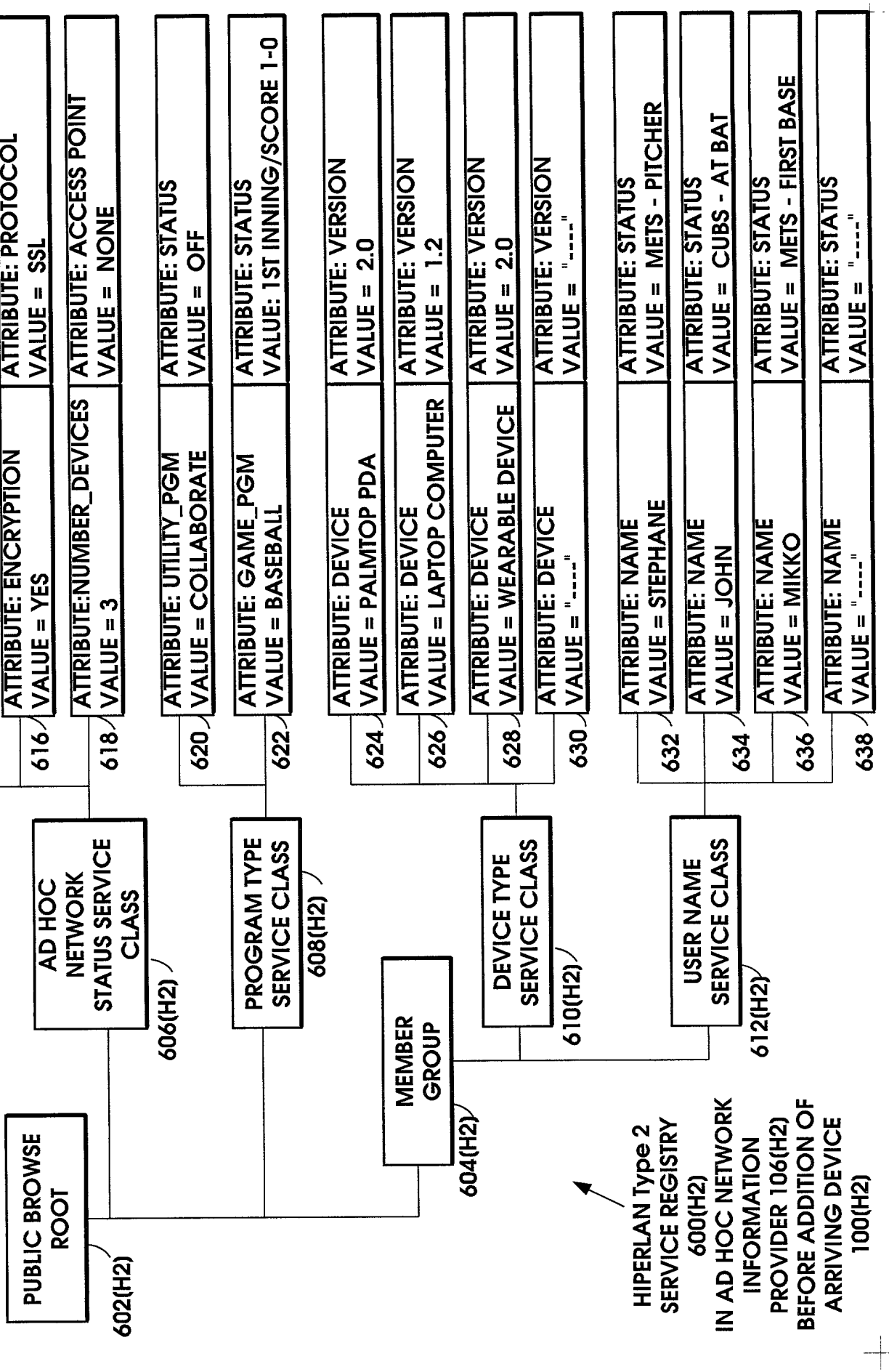

HIPERLAN TYPE 2 MAC FRAME STRUCTURE 800''
INCLUDING SERVICE RECORD RESPONSE 848,
SENT BY AD HOC NETWORK INFORMATION PROVIDER 106(H2)
TO ARRIVING DEVICE 100(H2)
800''
BROADCAST PHASE
802
DOWNLINK PHASE
810
DIRECT LINK PHASE
818
UPLINK PHASE
826
RANDOM ACCESS PHASE
834
848
SERVICE RECORD HANDLE LIST 578 AND ATTRIBUTES 579
850
850A
850B
850C
ATTRIBUTE: INFO_PROVIDER
VALUE = YES
614''
ATTRIBUTE: LAST UPDATE
VALUE = 14:35:23
615''
ATTRIBUTE: ENCRYPTION
VALUE = YES
616''
ATTRIBUTE: PROTOCOL
VALUE = SSL
617''
ATTRIBUTE:NUMBER_DEVICES
VALUE = 3
618''
ATTRIBUTE: ACCESS POINT
VALUE = NONE
619''
PART SENT IN 1ST MAC FRAME 800''
PART SENT IN 2ND MAC FRAME 800''A
PART SENT IN 3RD MAC FRAME 800''B
PART SENT IN 4TH MAC FRAME 800''C

FIG. 8D


PUBLIC BROWSE ROOT
602(H2)
AD HOC NETWORK STATUS SERVICE CLASS
606(H2)
PROGRAM TYPE SERVICE CLASS
608(H2)
MEMBER GROUP
604(H2)
DEVICE TYPE SERVICE CLASS
610(H2)
USER NAME SERVICE CLASS
612(H2)
ATTRIBUTE: INFO_PROVIDER VALUE = YES
614
ATTRIBUTE: LAST UPDATE VALUE = 14:35:23
ATTRIBUTE: ENCRYPTION VALUE = YES
616
ATTRIBUTE: PROTOCOL VALUE = SSL
ATTRIBUTE:NUMBER_DEVICES VALUE = 3
618
ATTRIBUTE: ACCESS POINT VALUE = NONE
ATTRIBUTE: UTILITY_PGM VALUE = COLLABORATE
620
ATTRIBUTE: STATUS VALUE = OFF
ATTRIBUTE: GAME_PGM VALUE = BASEBALL
622
ATTRIBUTE: STATUS VALUE: 1ST INNING/SCORE 1-0
ATTRIBUTE: DEVICE VALUE = PALMTOP PDA
624
ATTRIBUTE: VERSION VALUE = 2.0
ATTRIBUTE: DEVICE VALUE = LAPTOP COMPUTER
626
ATTRIBUTE: VERSION VALUE = 1.2
ATTRIBUTE: DEVICE VALUE = WEARABLE DEVICE
628
ATTRIBUTE: VERSION VALUE = 2.0
ATTRIBUTE: DEVICE VALUE = "----"
630
ATTRIBUTE: VERSION VALUE = "----"
ATTRIBUTE: NAME VALUE = STEPHANE
632
ATTRIBUTE: STATUS VALUE = METS - PITCHER
ATTRIBUTE: NAME VALUE = JOHN
634
ATTRIBUTE: STATUS VALUE = CUBS - AT BAT
ATTRIBUTE: NAME VALUE = MIKKO
636
ATTRIBUTE: STATUS VALUE = METS - FIRST BASE
ATTRIBUTE: NAME VALUE = "----"
638
ATTRIBUTE: STATUS VALUE = "----"
HIPERLAN Type 2 SERVICE REGISTRY 600(H2) IN AD HOC NETWORK INFORMATION PROVIDER 106(H2) BEFORE ADDITION OF ARRIVING DEVICE 100(H2)